50000 100,000 250,000 500,000
W X Y Z

‡ ^WBAL Baltimore, Md...T
*WBT Charlotte, N. C....W
WBIL New York City......S
*WPG Atlantic City, N. J....S
*^WRVA Richmond, Va.. W
WCOP Boston, Mass.......M
†WDEL Wilmington, Del....K
WOV New York City......O
^WSPR Springfield, Mass...M
‡WHAM Rochester, N.Y. W
*WWVA Wheeling, W. Va....S
*WCAU Philadelphia, Pa. W
WINS New York City...... O
^WTHT*WJNO-WRBL-WAYX
WABI*WIBX-WMFR-WOLS
WFTC-WEST-WKBO-WSAL
*WAIM WCAX WLVA WENY
WFOY-WPAX-WJEJ-WBRB
WSNJ-WGNY-WGBB↓WJTN
WSAY-WFAS‡WSOC-WKOK
^WBAX WBBL^WHAI-WOCB
†^WCAE Pittsburgh(WCAD) O
†WNAC Boston, Mass.......O
^WOL Washington, D.C.....O
CJCB Sydney.N.S..........O
WKAQ San Juan, P. R.....O
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*WNBX Springfield, Vt......M
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WTNJ-WCAM-WCAP NJ M
WATR Waterbury, Conn...K
WNEL San Juan, P. R.....M
WBBR-WFAB New York..O
WEVD-WHAZ New York..O
WLAK WTAL^WNBH*WBRK
^WLNH WMBO↓WEBR↓WMFF
*WSJS-WFBG-WSAJ-WJAC
WHAT-WTEL-WRAW‡WBRE
‡WORK York, Pa..........O
*WDRC Hartford, Conn.....O
‡^WFEA Manchester N.H. M
WFNC Kinston, N.C.........K
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*WMBR-WATL^WRDO-WCBM
^WLLH↓WABY-WBNY-WSYS
WMFD-WDAS-WRAK-WPRA
WBTM-WBLK-WCOS
WNBC New Britain, Conn.. K
KQV Pittsburgh, Pa........M
WQDM St Albans, Vt.......O
WARD-WVFW-WBBC NY M
^WAAB Boston, Mass...... M
WHIS Bluefield, W. Va...... K
WILM-WMFJ-WGPC-WAGM
*WMAS-WEED↓WLEU WFMJ
WAZL-WMBS-WPRP-WCHV
WGNC
*WHEC Rochester(*WOKO) M
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*WKBW Buffalo, N. Y......S
^WNLC*WRDW-WKEU WRGA
WGKV*WNBF-WCNW-WSPT
WWRL*WDNC‡WGAL-WWSW
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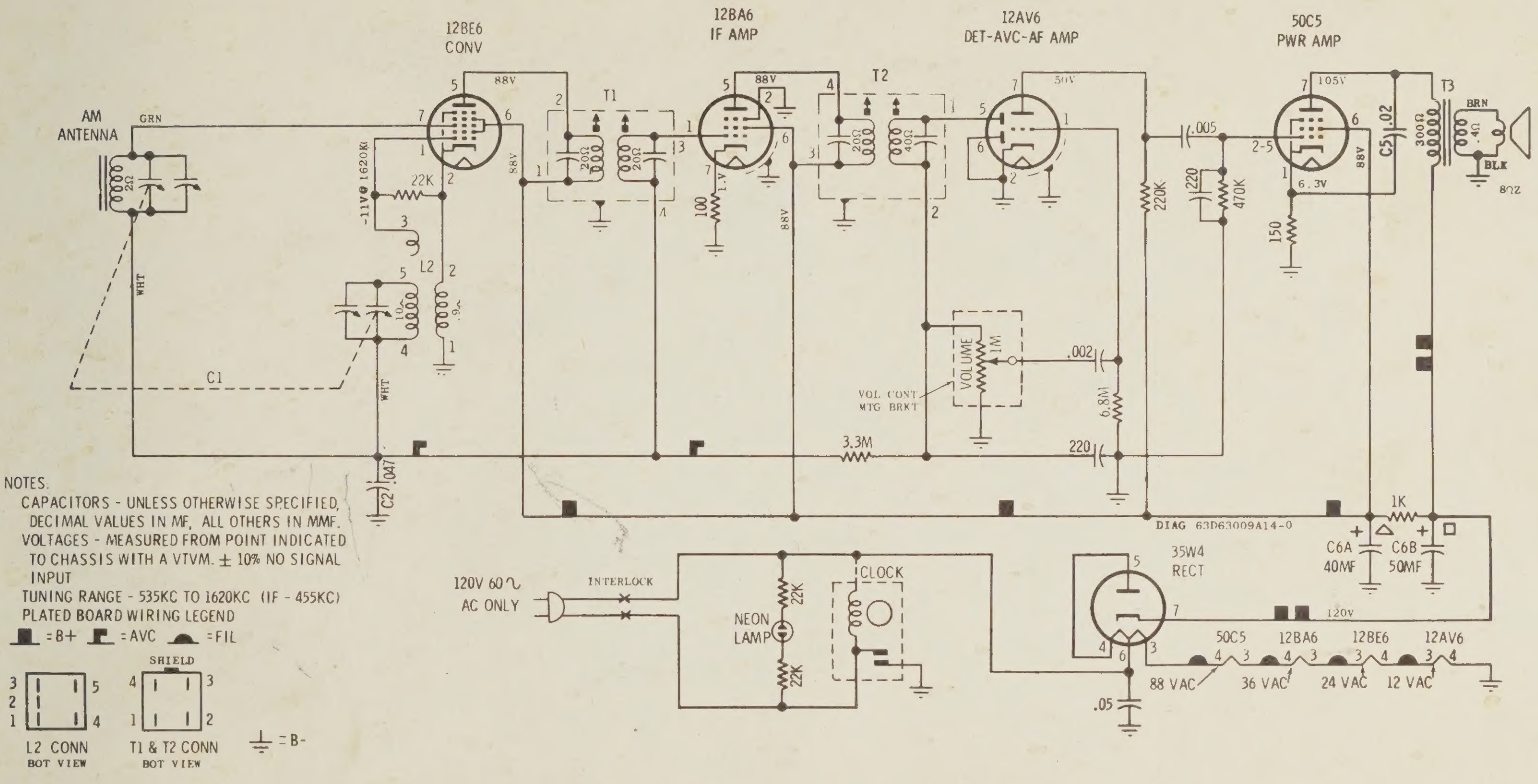

NOTES:

CAPACITORS - UNLESS OTHERWISE SPECIFIED, DECIMAL VALUES IN MF, ALL OTHERS IN MMF.

VOLTAGES - MEASURED FROM POINT INDICATED TO CHASSIS WITH A VTVM. ± 10% NO SIGNAL INPUT

TUNING RANGE - 535KC TO 1620KC (IF - 455KC)

PLATED BOARD WIRING LEGEND

■ =B+ ▛ =AVC ▲ =FIL

# MOTOROLA CHASSIS HS-4152

Sheet 68P60076A60-0

$1.00 TOLL BOTHWAYS

$ 3.00 UP (GAS)
3.00 DOWN
6.00
1.00 TOLL BRIDGE
7.00 GENERAL TOLLS
3.00
10.00 NORTHWAY UP
3.00 DOWN
3.00
16.00

25¢ TOLLS
3.00

7 5
83.61
37.52
46.09

47.00
16.00
31.00

√
31
6
25

√√√/6

5 20 25
3 3
16

20
13
7

83.61
40.00
43.61
2.48
46.09

9 9
40.00
37.52
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50000 W 100,000 X 250,000 Y 500,000 Z

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| | ↓▲WBAL Baltimore, Md...T |
| lo. W | |
| .Ill.. S | *WBT Charlotte, N. C....W |
| | |
| | WBIL New York City......S<br>*WPG Atlantic City, N.J....S |
| ex. W | *▲WRVA Richmond, Va.. W |
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| | WBIL New York City......S<br>*WPG Atlantic City, N.J....S |
| Tex. W | *▲WRVA Richmond. Va.. W |
| ....K<br>... M | WCOP Boston, Mass......M<br>†WDEL Wilmington, Del....K |
| ....U | WOV New York City......O |
| ...S | ▲WSPR Springfield, Mass...M |
| | ‡WHAM Rochester, N.Y . W |
| ...T | *WWVA Wheeling, W. Va....S |
| | *WCAU Philadelphia, Pa . W |
| ... O | WINS New York City...... O |
| 'a. O | |
| JBL<br>HBC<br>TOL | ▲WTHT*WJNO-WRBL-WAYX<br>WABI*WIBX-WMFR-WOLS<br>WFTC-WEST-WKBO-WSAL<br>*WAIM WCAX WLVA WENY |
| SBC<br>JIM<br>ALR<br>RAL | WFOY-WPAX-WJEJ-WBRB<br>WSNJ-WGNY-WGBB↓WJTN<br>WSAY-WFAS‡WSOC-WKOK<br>▲WBAX WBBL▲WHAI-WOCB |
| ...O | †▲WCAE Pittsburgh(WCAD) O |
| ...O | †WNAC Boston, Mass.......O<br>▲WOL Washington, D.C.....O |
| ...O<br>...M | CJCB Sydney.N.S.........O<br>WKAQ San Juan, P. R....O |
| ...K<br>....O | WNEW New York (WHBI) O<br>WAIR Winston-Salem, N.C. K |
| ...O<br>... O | *WNBX Springfield,Vt.....M |
| is.. M<br>...O | †WFBR Baltimore, Md..... O |
| n. O | *WORC Worcester, Mass... M<br>WTNJ-WCAM-WCAP NJ M |
| ...O | WATR Waterbury, Conn...K<br>WNEL San Juan. P. R.....M |
| ....O | WBBR-WFAB New York..O<br>WEVD-WHAZ New York.. O |
| GTN<br>BOW<br>EXL<br>VGH | WLAK WTAL▲WNBH*WBRK<br>▲WLNH WMBO↓WEBR↓WMFF<br>*WSJS-WFBG-WSAJ-WJAC<br>WHAT-WTEL-WRAW‡WBRE |
| ...O<br>...O | ‡WORK York, Pa..........O |
| ...O<br>... O | *WDRC Hartford, Conn.... O |
| ...O<br>....O | ‡▲WFEA Manchester N.H. M<br>WFNC Kinston. N.C.... ...K |
| ..M | WBNX New York (WAWZ) O |
| ..M<br>...M | *WFBL Syracuse, N. Y......O<br>‡WCSC Charleston, S. C....M |
| EOA<br>IBM<br>SAU | *WMBR-WATL▲WRDO-WCBM<br>▲WLLH↓WABY-WBNY-WSYS<br>WMFD-WDAS-WRAK-WPRA<br>WBTM-WBLK-WCOS |
| ...J<br>..M | WNBC New Britain, Conn.. K<br>KQV Pittsburgh, Pa.......M |
| ...O | WQDM St Albans,Vt......O |
| ..O | WARD-WVFW-WBBC NYM |
| ..M<br>.. M | ▲WAAB Boston, Mass...... M<br>WHIS Bluefield,W.Va..... K |
| LAP<br>JMS<br>IMA | WILM-WMFJ-WGPC-WAGM<br>*WMAS-WEED↓WLEU WFMJ<br>WAZL-WMBS-WPRP-WCHV<br>WGNC |
| .. O<br>..M | *WHEC Rochester(*WOKO) M<br>*WHP Harrisburg, Pa......M |
| ..M | ‡WSAN-WCBA Allentown . M |
| ..M<br>.. O | ▲WSAR Fall River, Mass....O<br>WHOM Jersey City, N. J.. K |
| | *WJSV Washington, D. C...T |
| ..S | WMEX Boston,Mass.......S |
| ...S | *WKBW Buffalo, N. Y......S |
| . T | |
| KBZ | ▲WNLC*WRDW-WKEU WRGA<br>WGKV*WNBF-WCNW-WSPT<br>WWRL*WDNC‡WGAL-WWSW<br>WSYB†WRTD-WKAT |
| .. H | CFRC Kingston, Ont......H |
| | ▲WBRY Waterbury, Conn... O |
| | WQXR New York,N.Y.....O |

# Notes on Successful Short Wave Tuning

**PROPER INSTALLATION:** A good antenna is the first requisite for successful short wave tuning. On the broadcast band almost any kind of antenna will function satisfactorily. However, on the short wave bands a special antenna is absolutely essential for best reception. Such antennas have been designed by us to operate in conjunction with the built-in antenna tuning systems in our receivers. The antenna is automatically tuned to give peak performance on all wave bands. Your Instruction Leaflet lists the antennas recommended for your receiver. Follow these recommendations for the best possible short wave reception. A good ground connection is also essential. A steam or water pipe makes an ideal ground.

**WHERE TO TUNE:** The short wave bands provide a variety of thrills. Below are listed the types of transmissions which you can expect to receive when "cruising" the short waves.

**POLICE RADIO STATIONS:** Dial 1.6 to 1.7 and 2.3 to 2.5 megacycles. You may hear several Police Stations at one point on the dial. Police stations transmit intermittently instead of continuously.

**AIRCRAFT RADIO STATIONS:** Dial 2.3 to 3.5 and 4.1 to 5.7 megacycles. Weather reports, landing conditions, plane positions, and other vital information are interchanged between planes and airports. At times you can hear both sides of airplane to airport conversations. At others you may hear airports in several different cities operating at the same point on the dial.

**SHIPS AT SEA:** Dial 4.1 to 4.4, 8.2 to 8.8, 12.3 to 13.3 megacycles. One sided conversations betwen ships and land stations may be heard. Transmission is irregular and in many cases the speech is electrically "garbled" to preserve secrecy.

**CODE (DOT-DASH) STATIONS:** (Found all over the short wave ranges.) The sound of code stations varies from faint chirping, whistling or buzzing to strong clicking or thumping. You will note the slow dot-dashes of the amateur or beginner and the staccato dot-dashes of high speed commercial code stations.

**AMATEUR PHONE STATIONS:** Dial 1.8 to 2.0, 3.9 to 4 and 14.15 to 14.25 megacycles. You'll get a kick out of listening to the "Hams," as the amateurs are known. With several thousand amateur stations in operation, the amateur bands are naturally crowded and interference is to be expected. You may hear several amateur stations at one point on the dial without turning the tuning knob. Amateur stations transmit intermittently instead of continuously.

**AMERICAN AND FOREIGN SHORT WAVE:**

| Dial | 6.0 to 6.5 megacycles (49 meter band) |
|---|---|
| | 9.5 to 10.0 megacycles (31 meter band) |
| | 11.5 to 12 megacycles (25 meter band) |
| | 15.0 to 15.5 megacycles (19 meter band) |
| | 17.8 to 17.9 megacycles (16 meter band) |

Here you will find European, Australian, South American and North American short wave stations offering a variety of programs. Some of the foreign stations have special programs for American listeners.

There are hundreds of short wave stations and we have listed only the principal ones in this time table.

The most reliable foreign short wave stations include: Daventry (London) England; Zeesen (Berlin) Germany; Pontoise (Paris) France; Madrid, Spain; Rome, Italy; and numerous Mexican and South American Stations. See pages 5 and 6 for listing of these stations and best times to hear them.

**WHEN TO TUNE:** Short wave stations cannot be tuned in at any point of the dial at any time of the day. One reason is the difference in time between the United States and foreign countries. For example when it is 11 o'clock in New York City it is 5 o'clock of the next day in London and Paris. Pages 5 and 6 tell when to listen for various stations.

Short wave stations transmitting at frequencies higher than about 12 megacycles are best for daytime reception. Night time reception will be best at frequencies lower than about 12 megacycles. The following general rules may be applied:

Daytime reception—11, 15 and 18 megacycle bands
Day and Night reception—9 megacycle band
Night reception—6 megacycle band

**CARE IN TUNING:** When tuning short wave stations, it is very important that the tuning knob be rotated very slowly and carefully in order to avoid passing up any stations. Careful tuning will develop weak signals to a fairly good strength and they will become easily audible. If your radio incorporates "Spread Band" tuning, you will find short wave tuning very much easier.

**FACTORS AFFECTING RECEPTION:** Man-made interference as well as atmospherics or static will cause poor reception. This man-made interference is caused by electric machinery such as trolleys, dial telephones, motors, electric fans, automobiles, airplanes, electrical appliances, flashing signs and oil burners. This type of interference creates far more disturbance on the short waves than it does on the standard broadcast band.

Fading is very much more pronounced on short waves. Quite often it is very rapid, making the voice or music seem to flutter. Sometimes it is slow, bringing the station in very strongly and clearly for a few minutes and then letting it die away so that it becomes almost inaudible.

Static or noise due to atmospheric conditions, sometimes lasting for several days, occasionally prevents satisfactory short wave reception.

| 100 | 250 | 300 | 500 | 750 | 1000 | 1500 | 2000 | 2500 | 5000 | WATTS POWER CODE | 10000 | 15000 | 25000 | 50000 | 100,000 | 250,000 | 500,000 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| H | K | L | M | N | O | P | Q | R | S | | T | U | V | W | X | Y | Z |

Revision 59 *Columbia; †NBC Red; ⸸NBC Blue; ‡NBC Red & Blue; ▲Mutual

| WESTERN<br>*Wash., Ore., Cal., Utah, Etc.* | MIDDLE WESTERN<br>*Minn., Ia., Neb., Mo., Tex., Etc* | KILO. | Dial No. | CENTRAL<br>*Ill., Mich., Ohio, Tenn., Etc.* | EASTERN<br>*Mass., N. Y., Pa., N. C., Etc.* |
|---|---|---|---|---|---|
| **CJRM** Moose Jaw, Sask....O | | 540 | | | **CFNB** Fredericton, N.B. M |
| **KOAC** Corvallis, Ore.......O<br>‡**KFYR** Bismarck, N. D.....O | †**KSD-KFUO** St. Louis, Mo. O<br>***KTSA** San Antonio, Tex...O | 550 | | ***WKRC** Cincinnati, Ohio....O<br>**WSVA** Staunton, Va.......M | ***WGR** Buffalo, N. Y........O<br>**WDEV** Waterbury Vt.......M |
| ***KLZ** Denver, Colo.........O<br>***KSFO** San Francisco, Cal..O | **KWTO** Springfield, Mo.....O<br>‡**KFDM** Beaumont, Tex.....O | 560 | | **WIND** Chicago-Gary.......O<br>‡**WIS** Columbia, S.C.........O | ⸸▲**WFIL** Philadelphia, Pa....O<br>***WQAM** Miami, Fla.........O |
| ***KVI** Tacoma, Wash.........O<br>***KMTR** Los Angeles, Cal...O | ***WNAX** Yankton, S. D......O<br>‡**KGKO** Ft. Worth, Tex.....O | 570 | | ***WKBN** Youngstown, Ohio. M<br>**WOSU** Columbus, Ohio....O | ‡**WWNC** Asheville, N. C.....O<br>**WMCA** New York (⸸**WSYR**) O |
| **CKUA** Edmonton, Alta.....M<br>‡**KMJ** Fresno, Cal..........O | ***WIBW** Topeka, Kas.......O<br>**KSAC** Manhattan, Kas....M | 580 | | **WILL** Urbana, Ill..........O<br>***WCHS** Charleston, W. Va..M | †**WTAG** Worcester, Mass....O<br>***WDBO** Orlando, Fla.......O |
| †**KHQ** Spokane, Wash.......O | †**WOW** Omaha, Neb........S | 590 | | **WKZO** Kalamazoo, Mich...K | ***WEEI** Boston, Mass........O |
| **CJOR** Vancouver, B C......M<br>⸸**KFSD** San Diego, Cal.....M | ⸸▲**WMT** Cedar Rapids, Ia..O<br>***WREC** Memphis, Tenn.....O | 600 | | ⸸**CFCF** Montreal, Que......M<br>**CBW** Windsor, Ont........M<br>**CMQ** Havana, Cuba..V | ⸸▲**WICC** Bridgeport, Conn. M<br>***WCAO** Baltimore, Md....M |
| **KFAR** Fairbanks, Alaska...O<br>▲**KFRC** San Francisco, Cal...O | †**WDAF** Kansas City, Mo....O | 610 | | ▲**WCLE** Cleveland, Ohio.....M | **WIP** Philadelphia, Pa.....O<br>‡**WIOD** Miami, Fla.........O |
| †**KGW** Portland, Ore.........O<br>‡**KTAR** Phoenix, Ariz.......O | **KWFT** Wichita Falls, Tex...K | 620 | | ‡**WTMJ** Milwaukee, Wis....O<br>‡**WFLA**-‡**WSUN** Florida....O | *▲**WLBZ** Bangor, Maine....O<br>**WHJB** Greensburg, Pa.....K |
| **CJRC** Winnipeg, Man.....[illegible]<br>**KGFX** Pierre, S.D.........[illegible] | **KFRU** Columbia, Mo......M | 630 | | ‡**WGBF** Evansville, Ind.....M<br>⸸**WMAL** Washington, D. C. K | **CFCY** Charlottetown, PEI..O<br>***WPRO** Providence, R. I....M |
| †**KFI** Los Angeles, Cal....W | **WOI** Ames, Iowa..........S | 640 | | ▲**WHKC** Columbus, Ohio...M | ***WGAN** Portland, Me.....M |
| | | 650 | | ‡▲**WSM** Nashville, Tenn...W | |
| | **WAAW** Omaha, Nebr......M | 660 | | **XEAL** Mexico City, Mex...O | †**WEAF** New York City...W |
| | | 670 | | †**WMAQ** Chicago, Ill.....W | |
| †**KPO** San Francisco, Cal..W | **KFEQ** St. Joseph, Mo......R | 680 | | **CMBQ** Havana, Cuba......S | **WLAW** Lawrence, Mass..O<br>‡**WPTF** Raleigh, N. C.......O |
| **CJCJ** Calgary, Alta.......M | **XET** Monterey, Mex........S | 690 | | **NAA** Arlington, Va.........O | ***CFRB** Toronto, Ont........S |
| | | 700 | | ▲‡**WLW** Cincinnati, Ohio..Z | |
| ***KIRO** Seattle, Wash......O<br>**KMPC** Beverly Hills, Cal M | | 710 | | | ▲**WOR** Newark, N. J......W |
| | | 720 | | ▲**WGN** Chicago, Ill......W | |
| **CJCA** Edmonton, Alta.....O | **XEPN** Pedras Negras, Mex. W | 730 | | **CMCL** Havana, ..(**CMK**). T | ***CKAC** Montreal, Que....S |
| **KTRB** Modesto, Cal.......K | **KMMJ** Clay Center, Neb..O | 740 | | †**WSB** Atlanta, Ga.......W | **WHEB** Portsmouth, N. H..K |
| ‡**KGU** Honolulu, Hawaii....R | | 750 | | ***WJR** Detroit, Mich.....W | **CMBL** Havana, Cuba......R |
| **KXA** Seattle, Wash........O<br>**XEOK** Tia Juana, Mex....K | **WLB** Minneapolis (**WCAL**).S<br>**WEW** St. Louis, Mo........O | 760 | | | ⸸**WJZ** New York (**WBAL**) W |
| | ***KFAB** Lincoln, Nebr.....T | 770 | | ***WBBM** Chicago, Ill.....W | **CMBF** Havaua, Cuba......S |
| **KWLK** Longview, Wash...K<br>**KEHE** Los Angeles, Cal....O | ‡**KGHL** Billings, Mont......O<br>**KFDY** Brookings, S. D.....O | 780 | | **WPIC** Sharon, Pa.........K<br>†**WMC** Memphis, Tenn.....O | ⸸▲**WEAN** Providence, R.I....O<br>‡**WTAR** Norfolk, Va.......O |
| ⸸**KGO** San Francisco, Cal..T | ‡**KOAM** Pittsburg, Kas.....Q | 790 | | | †**WGY** Schenectady, N. Y. W |
| | ‡**WFAA** Dallas, (‡**WBAP**). W | 800 | | **HIX** Santo Domingo, RD...O | **WTBO** Cumberland, Md..K |
| | ***WCCO** Minneapolis, Min W | 810 | | | **WNYC** New York City....O |
| **XEBG** Tia Juana, Mex....O | | 820 | | ***WHAS** Louisville, Ky...W | |
| | ⸸**KOA** Denver, Colo.......W | 830 | | **WRUF** Gainesville, Fla.....S | **WHDH** Boston, Mass.......O<br>**WEEU** Reading, Pa........O |
| **CFQC** Saskatoon, Sask.....O | **XERA** Villa Acuna, Mex....Z | 840 | | | ‡**CBL-CBT** Toronto, Ont. W |
| **KIEV** Glendale, Cal.......K | ***WWL** New Orleans, La...W | 850 | | **WKAR** E. Lansing, Mich...O | ***WESG** Elmira, N.Y.......O |
| **XEMO** Tiajuana, Mex.....S | ▲**WHB** Kansas City, Mo....O | 860 | | | ***WABC** New York......W |
| | | 870 | | ⸸**WENR-WLS** Chicago..W | |
| **KLX** Oakland, Cal.......O | **WSUI** Iowa City, Ia.......M<br>**KPOF** Denver..(***KFKA**). O | 880 | | **CBO** Ottawa, Ont.........O<br>***WCOC** Meridian, Miss.....O | ***WGBI-WQAN** Scranton, Pa O<br>**WRNL** Richmond, Va.....M |
| ***KFPY** Spokane, Wash...O<br>‡**KARK** Little Rock, Ark...M | **KFNF** Shenandoah(**KUSD**) O<br>**XEW** Mexico City........W | 890 | | **WSAA** Lafayette, Ind....M<br>***WMMN** Fairmont, W. Va..O | †**WJAR** Providence, R. I....M<br>***WGST** Atlanta, Ga.......O |
| **KGBU** Ketchikan, Alaska O<br>‡**KSEI** Pocatello, Idaho....K<br>***KHJ** Los Angeles, Cal...O | **WTAD** Quincy, Ill.........O<br>‡**WKY** Okla. City, Okla.....O | 900 | | **WLBL** Stevens Pt., Wis....S<br>‡**WJAX** Jacksonville, Fla....O | †**WBEN** Buffalo, N. Y.......O<br>**WELI** New Haven, Conn..M |
| **CJAT** Trail, B.C..........O | **XENT** Nueve Laredo, Mex. X | 910 | | **CKY** Winnipeg, Man......U | ‡**CBF** Montreal, Que......W |
| †**KOMO** Seattle, Wash......O | †**KPRC** Houston, Texas....O<br>▲**KFEL**⸸**KVOD** Denver.....M | 920 | | †**WWJ** Detroit, Mich........S<br>**WAAF** Chicago, Ill........O<br>**CMX** Havana.....T | **WORL** Boston, Mass......M<br>**WPEN** Philadelphia, Pa....O |
| **CFAC** Calgary, Alta.......O<br>**KROW** Oakland, Cal......O | ⸸**KMA** Shenandoah, Ia......O | 930 | | †**WBRC** Birmingham, Ala....O | **CHNS** Halifax, N.S.......M<br>***WDBJ** Roanoke, Va.......O |
| ***KOIN** Portland, Ore.......O | ⸸**WDAY** Fargo, N. D........O<br>**WHA** Madison, Wis........S | 940 | | ‡**WAVE** Louisville, Ky.......O<br>**XEFO** Mexico City, Mex...S | †**WCSH** Portland, Maine....O<br>**WAAT** Jersey City, N. J...M |
| **KFWB** Hollywood, Cal....O | ***KMBC** Kansas City, Mo...O | 950 | | **WHAL** Saginaw, Mich....M<br>**CMBC** Havana, Cuba......P | **CBV** Quebec Que.........O<br>†**WRC** Washington, D.C....O |
| | **XEAW** Reynosa, Tams....X | 960 | | **CRCY** Toronto, Ont.......H | **CHNC** New Carlisle, Que..O |
| ⸸**KJR** Seattle, Wash........S | | 970 | | ‡**WCFL** Chicago, Ill.......S | **WIBG** Glenside, Pa.......H |
| | | 980 | | | ⸸**KDKA** Pittsburgh, Pa...W |
| | **XEAF** Nogales, Mexico....N | 990 | | | ⸸**WBZ-WBZA** Boston...W |
| **KFVD** Los Angeles, Cal...O | †**WHO** Des Moines, Iowa. W | 1000 | | | |
| **CKCK** Regina, Sask.......O<br>▲**KQW** San Jose, Cal.......O | ▲**KGGF** Coffeyville, Kas....O<br>**WNAD** Norman, Okla.....O | 1010 | | ***WNOX** Knoxville, Tenn...O | **WHN** New York City......O |
| | **XEJ** Juarez, Mex.........O | 1020 | | **WDZ** Tuscola, Ill..........K | †**KYW** Philadelphia, Pa....T |
| **CFCN** Calgary, Alta......T | **XEB** Mexico City, Mex....Y | 1030 | | ▲**CKLW** Windsor-Detroit....S | **CMCK** Havana, Cuba......S |
| **KWJJ** Portland, Ore.......M<br>**KYOS** Merced, Cal........K | ***KRLD** Dallas, Tex........T | 1040 | | | †**WTIC** Hartford, Conn...W |
| ***KNX** Los Angeles, Cal..W | **WEAU** Eau Claire, Wis....O<br>**KFBI** Abilene, Kas........S | 1050 | | **WIBC** Indianapolis, Ind...O | †**CBM** Montreal, Que......S |

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| 100 | 250 | 300 | 500 | 750 | 1000 | 1500 | 2000 | 2500 | 5000 | WATTS POWER CODE | 10000 | 1500 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| H | K | L | M | N | O | P | Q | R | S | | T | U |

| | | | | |
|---|---|---|---|---|
| **WJAG** Norfolk, Nebr......O | ‡**KTHS** Hot Springs, Ark..T | 1060 | | |
| **KJBS** San Francisco, Cal.. M | **WCAZ** Carthage, Ill.......H | 1070 | | †**WTAM** Cleve |
| | | 1080 | | **WMBI-WCBD** |
| | ***KMOX** St. Louis, Mo...W | 1090 | | |
| **CBR** Vancouver, B. C.....S<br>▲**KGDM** Stockton, Cal......O | ***KWKH** Shreveport, La....T | 1100 | | |
| | **KSOO** Sioux Falls, S. D....S | 1110 | | **XELO** Piedras |
| **KFIO** Spok'e, Wash. (**KRSC**) H<br>**KFSG-KRKD** Los Angeles M | **CKX** Brandon, Man........O<br>**WTAW** College Station, Tex M<br>**KTBC** Austin, Tex...O | 1120 | | ***WISN** Milwauk<br>⸸**WJBO** Baton |
| ***KSL** Salt Lake City, Utah. W | | 1130 | | **WJJD** Chicago, |
| | ‡**KVOO** Tulsa, Okla......V | 1140 | | ***WAPI** Birmingh |
| | **XEH** Monterey, Mex......K | 1150 | | |
| | **XED** Guadalajara, Mex....M | 1160 | | ⸸**WOWO** Ft. Wa |
| | | 1170 | | |
| ⸸**KEX** Portland, Ore.......S<br>‡**KOB** Albuquerque, N. M...T | ▲**WDGY** Minneapolis, Minn..O | 1180 | | ***WMAZ** Macon, |
| **KTKC** Viscalia, Cal......K | ‡**WOAI** San Antonio, Tex. W | 1190 | | **WSAZ** Hunting |
| **KSUN-KGFJ-KVCV**▲**KVEC**<br>‡**KWG-KFXD-KDNC**▲**KOOS**<br>▲**KVOS**‡**KELO-KGVL-KFXJ**<br>**KGCI-KVNU-KAST** | **KBTM-KGHI-KGEK**<br>**KFJB-KMLB-WBNO-WJBW**<br>**KWNO-KGDE-WIL**<br>▲**KADA-WBBZ-WCAT-WDSM** | 1200 | | **WJHL**<br>**WBHP-WJRD-**<br>**WWAE-WFAM-**<br>**WCPO-WHBY-** |
| **KGLU**<br>▲**KDON-KPPC*KROY**▲**KFXM**<br>‡**KPFA-KLAH-KFJI**▲**KGY**<br>**KHBG**▲**KASA-KWTN-KWJB** | **KFPW-WHBF*KGLO-KIUL**<br>**KANS*WMFG-WGRM-WGCM**<br>**KFVS**▲**KFOR-KDLR**▲**KVSO**<br>**KALB-WJMC-KOCA-WIBU** | 1210 | | **WJBY-WCRW-**<br>**WEBQ-WTAX-**<br>**WJW**‡**WCOL-**<br>**WSIX-WCOV-** |
| **KTW** Seattle...(**KWSC**)...O | ⸸**WREN-KFKU** Kansas City O | 1220 | | ***WDAE** Tampa, |
| **CJOC** Lethbridge, Alta....H<br>**KYA** San Francisco, Cal...O | ‡**KGBX** Springfield, Mo....M<br>**KGGM** Albuquerque, N.M. O | 1230 | | ***WFBM** Indiana |
| **KGCU** Manden No. Dakota K<br>‡**KTFI** Twin Falls, Idaho...M | ▲**KTAT** Ft. Worth, Tex.....O | 1240 | | ⸸**WXYZ** Detroit,<br>**XEKL** Leon, M |
| ▲**KIT** Yakima, Wash.......M<br>**KFOX** Long Beach, Cal....O | ⸸**WTCN** Minneapolis, Minn..O<br>**KXOK** St. Louis, Mo.......O | 1250 | | **WEST** New Cas<br>⸸**WDSU** New Or |
| ***KGVO** Missoula, Mont....O<br>**KVOA** Tucson, Arizona....O<br>**KHSL** Chico, Cal.....K | ⸸▲**KOIL** Omaha, Nebr.......O<br>**KPAC** Port Arthur(‡**KRGV**) O | 1260 | | ***WHIO** Dayton,<br>***WTOC** Savanna |
| ***KOL** Seattle, Wash.........O | **KWLC-KGCA** Decorah, Ia H<br>***KVOR** Colo. Springs, Colo..O | 1270 | | ⸸**WOOD-WASH**<br>†**WJDX** Jackson, |
| ***KFBB** Great Falls, Mont...O<br>**KLS** Oakland, Cal.........K | ‡**WIBA** Madison, Wis.......O<br>▲**WRR** Dallas, Tex.........M | 1280 | | ***WDOD** Chattan |
| ***KDYL** Salt Lake City.....O | ‡**WEBC** Duluth, Minn.......O<br>***KTRH** Houston, Tex.......O | 1290 | | ***WJAS** Pittsbur |
| **KALE** Portland, Ore.......O<br>**KFAC** Los Angeles, Cal....O | **WHBL** Sheboygan, Wis....M<br>***KFH** Wichita, Kas.........O | 1300 | | ‡**WFBC** Greenvi |
| ***KARM-KCRJ-KSRO KHUB**<br>**KGEZ-KRQA-KSUB-KPDN**<br>▲**KXRO-KGFW-KBND** | **KCKN-KVOL-KRMD-KOME**<br>**KVOX-KROC-KRBA-KWOS**<br>**KWOC-KRRV-KOCY-KAND**<br>**KFPL**‡**KTSM-WDAH-KFYO** | 1310 | | ⸸**WSGN-WGAU-**<br>**WCLS-WTRC-**<br>**WCMI**⸸**WFDF-**<br>**WTJS**‡**WROL-** |
| **KID** Idaho Falls, Idaho....M<br>*▲**KGMB** Honolulu..........O | ***KRNT** Des Moines, Iowa...O<br>‡**KGHF** Pueblo, Colo........M | 1320 | | ***WADC** Akron,<br>†**WSMB** New O |
| ▲**KMO** Tacoma, Wash......O<br>▲**KGB** San Diego, Cal.......O | ***KSCJ** Sioux City, Ia.......O<br>‡**KRIS** Corpus Christi, Tex..M | 1330 | | ***WTAQ** Green<br>‡▲**WSAI** Cincinn |
| ‡**KGIR** Butte, Mont........M | **KDTH** Dubuque, Iowa....M<br>**KGNO** Dodge City, Kas....K | 1340 | | ⸸**WSPD** Toledo,<br>***WCOA** Pensaco |
| ‡**KIDO** Boise, Idaho........O | ⸸▲**KWK** St. Louis, Mo.......O | 1350 | | †**WMBG** Richm |
| **KLPM** Minot, N. D.......M<br>**KGER** Long Beach, Cal....O | ▲**KCRC** Enid, Okla.........K<br>**WQBC** Vicksburg, Miss....O | 1360 | | **WGES** Chicago<br>***WSBT** South B |
| ***KGAR**‡**KERN-KRE-KICA**<br>**KGFL**▲**KSLM-KOBH**<br>**KRKO-KEEN-KUJ-KWYO**<br>**KIUP-KOKO-KGKL-KRMC** | **KELD-KONO-KTEM-KFGQ**<br>***WOC-KVGB-WMIN*WHLB**<br>**WFOR**▲**KTOK-KFJZ**<br>**KLUF-KFRO-KMAC-KVRS** | 1370 | | **WMFO-WAGF-**<br>‡**WGL-WGRC-**<br>**WPAY-WHBQ-**<br>**WHLS** |
| ***KOH** Reno, Nev..........M | ***WKBH** La Crosse, Wis.....O | 1380 | | **WSMK** Dayton<br>‡**WALA** Mobile |
| **KRLC** Lewiston, Ida...K<br>***KOY** Phoenix, Ariz........O | ***KLRA** Little Rock, Ark....O | 1390 | | ⸸▲**WHK** Clevela |
| ⸸**KLO** Ogden, U..(***KHBC**) M | ***KTUL** Tulsa, Okla.........O | 1400 | | †**WIRE** Indianap |
| ‡**KMED** Medford, Ore......K<br>‡**KGNC** Amarillo, Tex.......O | **KFJM** Grand Forks, N.D..M<br>**WROK** Rockford, Ill.......M | 1410 | | **WSCM** Bay Cit<br>***WSFA** Montgo |
| **KUMA-KSAN-KRBM**▲**KORE**<br>**KBPS-KXL-KEUB-KGIW**<br>**KIDW-KWBG-KRLH-KATE**<br>**KVAK** | **KCMC-KLBM-WJBO-WMBH**<br>▲**KGFF-KABR-KRBC-KNET**<br>**KIUN-KABC*WACO-KFIZ**<br>**KDNT-KFAM-KRIC-KTRI** | 1420 | | **WMSD-WHFC-**<br>**WPAD**⸸**WELL-**<br>**WAPO*WPAR-** |
| **KINY** Juneau, Alaska.....K<br>⸸**KECA** Los Angeles, Cal....O | ⸸▲**KSO** Des Moines, Ia......K<br>**KGNF** No. Platte, Neb.....O | 1430 | | ***WBNS** Columb<br>⸸**WMPS** Memph |
| ▲**KELA** Centralia, Wash....M<br>**KDFN** Casper, Wyo.......M | ***WMBD** Peoria, Ill........O<br>⸸**KXYZ** Houston, Tex.......O | 1440 | | ***WBIG** Greensb |
| ▲**KIEM** Eureka, Cal.......M<br>**KGCX** Wolf Point, Mont...O | **KCMO** Kansas City, Mo...O<br>‡**KTBS** Shreveport, La......O | 1450 | | ***WGAR** Clevela<br>⸸**WAGA** Atlanta |
| | †**KSTP** St. Paul, Minn......T | 1460 | | |
| ⸸**KGA** Spokane, Wash......S | | 1470 | | ***WLAC** Nashvill |
| | ***KOMA** Okla. City, Okla....S | 1480 | | **WHIP** Hammo |
| ‡**KFBK** Sacramento, Cal....T | | 1490 | | ‡**WCKY** Cincinn |
| **KSAM-KBKR-KROD-KYCA**<br>▲**KPQ**▲**KXO**▲**KVOE**▲**KDB**<br>**KAWM-KOVC**▲**KRNR-KUTA**<br>**KSAL-KWEW-KVWC** | **KOTN*WKBB-WTMV-KPAB**<br>**KPLC*KDAL-KGKY**▲**KBIX**<br>***KNOW-KBST-KNEL-KGFI**<br>**KYSM-KPLT-KGKB-WGIL** | 1500 | | **WHBB-WKEV-**<br>**WOMI-WOPI-** |
| | | 1510 | | **CKCR** Waterlo |
| | **KITE** Kansas City, Mo.....O | 1530 | | |
| ▲**KFMC** Bakersfield, Cal....O | | 1550 | | |

| 100 | 250 | 300 | 500 | 750 | 1000 | 1500 | 2000 | 2500 | 5000 | WATTS POWER CODE | 10000 | 15000 | 25000 | 50000 | 100,000 | 250,000 | 500,000 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| H | K | L | M | N | O | P | Q | R | S |  | T | U | V | W | X | Y | Z |

Revision 59 *Columbia; †NBC Red; ↓NBC Blue; ‡NBC Red & Blue; ▲Mutual

| WESTERN *Wash., Ore., Cal., Utah, Etc.* | MIDDLE WESTERN *Minn., Ia., Neb., Mo., Tex., Etc* | KILO. | Dial No. | CENTRAL *Ill., Mich., Ohio, Tenn., Etc.* | EASTERN *Mass., N. Y., Pa., N. C., Etc.* |
|---|---|---|---|---|---|
| **CJRM** Moose Jaw, Sask....O |  | 540 |  |  |  |
| **KOAC** Corvallis, Ore.......O<br>‡**KFYR** Bismarck, N. D.....O | †**KSD-KFUO** St. Louis, Mo. O<br>***KTSA** San Antonio, Tex...O | 550 |  | ***WKRC** Cincinnati, Ohio....O<br>**WSVA** Staunton, Va......M | **CFNB** Fredericton, N.B. M<br>***WGR** Buffalo, N. Y........O<br>**WDEV** Waterbury Vt......M |
| ***KLZ** Denver, Colo.........O<br>***KSFO** San Francisco, Cal..O | **KWTO** Springfield, Mo.... O<br>‡**KFDM** Beaumont, Tex.....O | 560 |  | **WIND** Chicago-Gary.......O<br>‡**WIS** Columbia, S.C........O | ↓▲**WFIL** Philadelphia, Pa... O<br>***WQAM** Miami, Fla.........O |
| ***KVI** Tacoma, Wash.........O<br>▲**KMTR** Los Angeles, Cal...O | ***WNAX** Yankton, S. D.....O<br>‡**KGKO** Ft. Worth, Tex....O | 570 |  | ***WKBN** Youngstown, Ohio. M<br>**WOSU** Columbus, Ohio....O | ‡**WWNC** Asheville, N. C.....O<br>**WMCA** New York (↓**WSYR**) Q |
| **CKUA** Edmonton, Alta....M<br>‡**KMJ** Fresno, Cal..........O | ***WIBW** Topeka, Kas.......O<br>**KSAC** Manhattan, Kas....M | 580 |  | **WILL** Urbana, Ill..........O<br>***WCHS** Charleston, W. Va..M | †**WTAG** Worcester, Mass....O<br>***WDBO** Orlando, Fla........O |
| †**KHQ** Spokane, Wash.......O | †**WOW** Omaha, Neb.........S | 590 |  | **WKZO** Kalamazoo, Mich...K | ***WEEI** Boston, Mass........O |
| **CJOR** Vancouver, B C......M<br>↓**KFSD** San Diego, Cal......M | ↓▲**WMT** Cedar Rapids, Ia..O<br>***WREC** Memphis, Tenn....O | 600 |  | ↓**CFCF** Montreal, Que......M<br>**CBW** Windsor. Ont.........M<br>**CMQ** Havana, Cuba..V | ↓▲**WICC** Bridgeport, Conn. M<br>***WCAO** Baltimore, Md.... M |
| **KFAR** Fairbanks, Alaska...O<br>▲**KFRC** San Francisco, Cal...O | †**WDAF** Kansas City, Mo....O | 610 |  | ▲**WCLE** Cleveland, Ohio....M | **WIP** Philadelphia, Pa.....O<br>‡**WIOD** Miami, Fla..........O |
| †**KGW** Portland, Ore.........O<br>‡**KTAR** Phoenix, Aris.......O | **KWFT** Wichita Falls, Tex...K | 620 |  | ‡**WTMJ** Milwaukee, Wis....O<br>‡**WFLA**-‡**WSUN** Florida....O | *▲**WLBZ** Bangor, Maine....O<br>**WHJB** Greensburg, Pa.....K |
| **CJRC** Winnipeg, Man.....O<br>**KGFX** Pierre, S.D.........J | **KFRU** Columbia, Mo......M | 630 |  | ‡**WGBF** Evansville, Ind.....M<br>↓**WMAL** Washington, D. C. K | **CFCY** Charlottetown, PEI..O<br>***WPRO** Providence, R. I.... M |
| †**KFI** Los Angeles, Cal ....W | **WOI** Ames, Iowa..........S | 640 |  | ▲**WHKC** Columbus, Ohio...M | ***WGAN** Portland, Me..... M |
|  |  | 650 |  | ‡▲**WSM** Nashville, Tenn...W |  |
|  | **WAAW** Omaha, Nebr......M | 660 |  | **XEAL** Mexico City, Mex...O | †**WEAF** New York City...W |
|  |  | 670 |  | †**WMAQ** Chicago, Ill.....W |  |
| †**KPO** San Francisco, Cal..W | **KFEQ** St. Joseph, Mo......R | 680 |  | **CMBQ** Havana, Cuba......S | **WLAW** Lawrence, Mass..O<br>‡**WPTF** Raleigh, N. C.......O |
| **CJCJ** Calgary, Alta.......M | **XET** Monterey, Mex........S | 690 |  | **NAA** Arlington, Va.........O | ***CFRB** Toronto, Ont.......S |
|  |  | 700 |  | ▲‡**WLW** Cincinnati, Ohio..Z |  |
| ***KIRO** Seattle, Wash...... O<br>**KMPC** Beverly Hills, Cal M |  | 710 |  |  | ▲**WOR** Newark, N. J......W |
|  |  | 720 |  | ▲**WGN** Chicago, Ill.......W |  |
| **CJCA** Edmonton, Alta.....O | **XEPN** Pedras Negras, Mex. W | 730 |  | **CMCL** Havana, ..(**CMK**).T | ***CKAC** Montreal, Que....S |
| **KTRB** Modesto, Cal.......K | **KMMJ** Clay Center, Neb..O | 740 |  | †**WSB** Atlanta, Ga.......W | **WHEB** Portsmouth, N. H..K |
| ‡**KGU** Honolulu, Hawaii....R |  | 750 |  | ***WJR** Detroit, Mich. ....W | **CMBL** Havana. Cuba......R |
| **KXA** Seattle, Wash........O<br>**XEOK** Tia Juana, Mex.... K | **WLB** Minneapolis (**WCAL**).S<br>**WEW** St. Louis, Mo........O | 760 |  |  | ↓**WJZ** New York (**WBAL**) W |
|  | ***KFAB** Lincoln, Nebr.....T | 770 |  | ***WBBM** Chicago, Ill.....W | **CMBF** Havana, Cuba......S |
| **KWLK** Longview, Wash...K<br>**KEHE** Los Angeles, Cal....O | ‡**KGHL** Billings, Mont......O<br>**KFDY** Brookings, S. D.....O | 780 |  | **WPIC** Sharon, Pa.........K<br>†**WMC** Memphis, Tenn......O | ↓▲**WEAN** Providence, R.I...O<br>‡**WTAR** Norfolk, Va.......O |
| ↓**KGO** San Francisco, Cal..T | ‡**KOAM** Pittsburg, Kas.....Q | 790 |  |  | †**WGY** Schenectady, N. Y. W |
|  | ‡**WFAA** Dallas, (‡**WBAP**).W | 800 |  | **HIX** Santo Domingo, RD...O | **WTBO** Cumberland, Md...K |
|  | ***WCCO** Minneapolis, Min W | 810 |  |  | **WNYC** New York City.... O |
| **XEBG** Tia Juana, Mex....O |  | 820 |  | ***WHAS** Louisville, Ky... W |  |
|  | ↓**KOA** Denver, Colo......W | 830 |  | **WRUF** Gainesville, Fla.....S | **WHDH** Boston, Mass......O<br>**WEEU** Reading, Pa.........O |
| **CFQC** Saskatoon, Sask..... O | **XERA** Villa Acuna, Mex. ...Z | 840 |  |  | ‡**CBL-CBT** Toronto, Ont. W |
| **KIEV** Glendale, Cal.......K | ***WWL** New Orleans, La...W | 850 |  | **WKAR** E. Lansing, Mich...O | ***WESG** Elmira, N.Y........O |
| **XEMO** Tiajuana, Mex.....S | ▲**WHB** Kansas City, Mo.....O | 860 |  |  | ***WABC** New York......W |
|  |  | 870 |  | ↓**WENR-WLS** Chicago.. W |  |
| **KLX** Oakland, Cal.......O | **WSUI** Iowa City, Ia. .....M<br>**KPOF** Denver..(***KFKA**). O | 880 |  | **CBO** Ottawa, Ont.........O<br>***WCOC** Meridian, Miss.....O | ***WGBI-WQAN** Scranton, Pa O<br>**WRNL** Richmond, Va. ...M |
| ***KFPY** Spokane, Wash...O<br>‡**KARK** Little Rock, Ark....M | **KFNF** Shenandoah (**KUSD**) O<br>**XEW** Mexico City.........W | 890 |  | **WBAA** Lafayette, Ind....M<br>***WMMN** Fairmont, W. Va.. O | †**WJAR** Providence, R. I....M<br>***WGST** Atlanta, Ga........O |
| **KGBU** Ketchikan, Alaska O<br>‡**KSEI** Pocatello, Idaho.....K<br>▲**KHJ** Los Angeles, Cal....O | **WTAD** Quincy, Ill.........O<br>‡**WKY** Okla. City, Okla.....O | 900 |  | **WLBL** Stevens Pt., Wis...S<br>‡**WJAX** Jacksonville, Fla....O | †**WBEN** Buffalo, N. Y.......O<br>**WELI** New Haven, Conn...M |
| **CJAT** Trail, B.C..........O | **XENT** Nueve Laredo, Mex.X | 910 |  | **CKY** Winnipeg, Man.......U | ‡**CBF** Montreal, Que......W |
| †**KOMO** Seattle, Wash. ....O | †**KPRC** Houston, Texas.....O<br>▲**KFEL**↓**KVOD** Denver.....M | 920 |  | †**WWJ** Detroit, Mich........S<br>**WAAF** Chicago, Ill........O<br>**CMX** Havana.....T | **WORL** Boston, Mass......M<br>**WPEN** Philadelphia, Pa....O |
| **CFAC** Calgary, Alta........O<br>**KROW** Oakland, Cal.......O | ↓**KMA** Shenandoah, Ia......O | 930 |  | †**WBRC** Birmingham, Ala....O | **CHNS** Halifax, N S........M<br>***WDBJ** Roanoke, Va.......O |
| ***KOIN** Portland, Ore.......O | ‡**WDAY** Fargo, N. D........O<br>**WHA** Madison, Wis........S | 940 |  | ‡**WAVE** Louisville, Ky......O<br>**XEFO** Mexico City. Mex...S | †**WCSH** Portland, Maine....O<br>**WAAT** Jersey City, N. J...M |
| **KFWB** Hollywood, Cal....O | ***KMBC** Kansas City, Mo...O | 950 |  | **WHAL** Saginaw, Mich.... M<br>**CMBC** Havana, Cuba......P | **CBV** Quebec Que..........O<br>†**WRC** Washington, D.C....O |
|  | **XEAW** Reynosa, Tams.... X | 960 |  | **CRCY** Toronto, Ont. ......H | **CHNC** New Carlisle, Que..O |
| ↓**KJR** Seattle, Wash........S |  | 970 |  | ‡**WCFL** Chicago, Ill........S | **WIBG** Glenside, Pa....... H |
|  |  | 980 |  |  | ↓**KDKA** Pittsburgh, Pa...W |
|  | **XEAF** Nogales, Mexico.... N | 990 |  |  | ↓**WBZ-WBZA** Boston...W |
| **KFVD** Los Angeles, Cal...O | †**WHO** Des Moines, Iowa. W | 1000 |  |  |  |
| **CKCK** Regina, Sask.......O<br>▲**KQW** San Jose, Cal.......O | ▲**KGGF** Coffeyville, Kas....O<br>**WNAD** Norman, Okla.....O | 1010 |  | ***WNOX** Knoxville, Tenn....O | **WHN** New York City......O |
|  | **XEJ** Juarez, Mex.........O | 1020 |  | **WDZ** Tuscola, Ill..........K | †**KYW** Philadelphia, Pa....T |
| **CFCN** Calgary, Alta.. ....T | **XEB** Mexico City, Mex....Y | 1030 |  | ▲**CKLW** Windsor-Detroit....S | **CMCK** Havana, Cuba.....S |
| **KWJJ** Portland, Ore.......M<br>**KYOS** Merced, Cal.......K | ***KRLD** Dallas, Tex.......T | 1040 |  |  | †**WTIC** Hartford, Conn...W |
| ***KNX** Los Angeles, Cal ..W | **WEAU** Eau Claire, Wis....O<br>**KFBI** Abilene, Kas......S | 1050 |  | **WIBC** Indianapolis, Ind....O | †**CBM** Montreal, Que......S |

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| 100 | 250 | 300 | 500 | 750 | 1000 | 1500 | 2000 | 2500 | 5000 | WATTS POWER CODE | 10000 | 150 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| H | K | L | M | N | O | P | Q | R | S |  | T | U |

|  |  |  |  |  |
|---|---|---|---|---|
| **WJAG** Norfolk, Nebr.......O | ‡**KTHS** Hot Springs, Ark..T | 1060 |  |  |
| **KJBS** San Francisco, Cal.. M | **WCAZ** Carthage, Ill. .......H | 1070 |  | †**WTAM** Clev |
|  |  | 1080 |  | **WMBI-WCB** |
|  | ***KMOX** St. Louis, Mo... W | 1090 |  |  |
| **CBR** Vancouver, B. C......S<br>▲**KGDM** Stockton, Cal......O | ***KWKH** Shreveport, La. ...T | 1100 |  |  |
|  | **KSOO** Sioux Falls, S. D....S | 1110 |  | **XELO** Piedras |
| **KFIO** Spok'e, Wash, (**KRSC**) H<br>**KFSG-KRKD** Los Angeles M | **CKX** Brandon, Man.........O<br>**WTAW** College Station, Tex M<br>**KTBC** Austin, Tex...O | 1120 |  | ***WISN** Milwau<br>↓**WJBO** Baton |
| ***KSL** Salt Lake City, Utah.W |  | 1130 |  | **WJJD** Chicago |
|  | ‡**KVOO** Tulsa, Okla......V | 1140 |  | ***WAPI** Birming |
|  | **XEH** Monterey, Mex......K | 1150 |  |  |
|  | **XED** Guadalajara, Mex....M | 1160 |  | ↓**WOWO** Ft. Wa |
|  |  | 1170 |  |  |
| ↓**KEX** Portland, Ore.........S<br>‡**KOB** Albuquerque, N. M...T | ▲**WDGY** Minneapolis, Minn.. O | 1180 |  | ***WMAZ** Macon |
| **KTKC** Viscalia, Cal.......K | ‡**WOAI** San Antonio, Tex. W | 1190 |  | **WSAZ** Huntin |
| **KSUN-KGFJ-KVCV**▲**KVEC**<br>‡**KWG-KFXD-KDNC**▲**KOOS**<br>▲**KVOS**‡**KELO-KGVL-KFXJ**<br>**KGCI-KVNU-KAST** | **KBTM-KGHI-KGEK**<br>**KFJB-KMLB-WBNO-WJBW**<br>**KWNO-KGDE-WIL**<br>▲**KADA-WBBZ-WCAT-WDSM** | 1200 |  | **WJHL**<br>**WBHP-WJRD-**<br>**WWAE-WFAM-**<br>**WCPO-WHBY-** |
| **KGLU**<br>▲**KDON-KPPC***KROY**▲**KFXM**<br>‡**KPFA-KLAH-KFJI**▲**KGY**<br>**KHBG**▲**KASA-KWTN-KWJB** | **KFPW-WHBF***KGLO-KIUL**<br>**KANS***WMFG-WGRM-WGCM**<br>**KFVS**▲**KFOR-KDLR**▲**KVSO**<br>**KALB-WJMC-KOCA-WIBU** | 1210 |  | **WJBY-WCRW-**<br>**WEBQ-WTAX-**<br>**WJW**‡**WCOL-**<br>**WSIX-WCOV-** |
| **KTW** Seattle...(**KWSC**)...O | ↓**WREN-KFKU** Kansas City O | 1220 |  | ***WDAE** Tampa |
| **CJOC** Lethbridge, Alta.....H<br>**KYA** San Francisco, Cal...O | ‡**KGBX** Springfield, Mo....M<br>**KGGM** Albuquerque, N.M. O | 1230 |  | ***WFBM** Indian |
| **KGCU** Mandan No. Dakota K<br>‡**KTFI** Twin Falls, Idaho...M | ▲**KTAT** Ft. Worth, Tex.....O | 1240 |  | ↓**WXYZ** Detroit<br>**XEKL** Leon, |
| ▲**KIT** Yakima, Wash.......M<br>**KFOX** Long Beach, Cal....O | ↓**WTCN** Minneapolis, Minn..O<br>**KXOK** St. Louis, Mo.......O | 1250 |  | **WEST** New Ca<br>↓**WDSU** New O |
| ***KGVO** Missoula, Mont....O<br>**KVOA** Tucson, Arizona....O<br>**KHSL** Chico, Cal.....K | ↓▲**KOIL** Omaha, Nebr......O<br>**KPAC** Port Arthur (‡**KRGV**) O | 1260 |  | ***WHIO** Dayton<br>***WTOC** Savann |
| ▲**KOL** Seattle, Wash.........O | **KWLC-KGCA** Decorah, Ia H<br>***KVOR** Colo. Springs, Colo..O | 1270 |  | ↓**WOOD-WASH**<br>†**WJDX** Jackso |
| ***KFBB** Great Falls, Mont...O<br>**KLS** Oakland, Cal.........K | ‡**WIBA** Madison, Wis.......O<br>▲**WRR** Dallas, Tex..........M | 1280 |  | ***WDOD** Chatta |
| ***KDYL** Salt Lake City.....O | ‡**WEBC** Duluth, Minn......O<br>***KTRH** Houston, Tex......O | 1290 |  | ***WJAS** Pittsbu |
| **KALE** Portland, Ore.......O<br>**KFAC** Los Angeles, Cal....O | **WHBL** Sheboygan, Wis....M<br>***KFH** Wichita, Kas.........O | 1300 |  | ‡**WFBC** Greenv |
| ***KARM-KCRJ-KSRO KHUB**<br>**KGEZ-KRQA-KSUB-KPDN**<br>▲**KXRO-KGFW-KBND** | **KCKN-KVOL-KRMD-KOME**<br>**KVOX-KROC-KRBA-KWOS**<br>**KWOC-KRRV-KOCY-KAND**<br>**KFPL**‡**KTSM-WDAH-KFYO** | 1310 |  | ↓**WSGN-WGAU-**<br>**WCLS-WTRC-**<br>**WCMI**↓**WFDF-**<br>**WTJS**‡**WROL-** |
| **KID** Idaho Falls, Idaho....M<br>*▲**KGMB** Honolulu.........O | ***KRNT** Des Moines, Iowa...O<br>‡**KGHF** Pueblo, Colo........M | 1320 |  | ***WADC** Akron,<br>†**WSMB** New C |
| ▲**KMO** Tacoma, Wash......O<br>▲**KGB** San Diego, Cal.......O | ***KSCJ** Sioux City, Ia.......O<br>‡**KRIS** Corpus Christi, Tex..M | 1330 |  | ***WTAQ** Green<br>‡▲**WSAI** Cincin |
| ‡**KGIR** Butte, Mont........M | **KDTH** Dubuque, Iowa....M<br>**KGNO** Dodge City, Kas....K | 1340 |  | ↓**WSPD** Toledo,<br>***WCOA** Pensac |
| ‡**KIDO** Boise, Idaho........O | ↓▲**KWK** St. Louis, Mo.......O | 1350 |  | †**WMBG** Richn |
| **KLPM** Minot, N. D......M<br>**KGER** Long Beach, Cal....O | ▲**KCRC** Enid, Okla........K<br>**WQBC** Vicksburg, Miss....O | 1360 |  | **WGES** Chicag<br>***WSBT** South |
| ***KGAR**‡**KERN-KRE-KICA**<br>**KGFL**▲**KSLM-KOBH**<br>**KRKO-KEEN-KUJ-KWYO**<br>**KIUP-KOKO-KGKL-KRMC** | **KELD-KONO-KTEM-KFGQ**<br>***WOC-KVGB-WMIN***WHLB**<br>**WFOR**▲**KTOK-KFJZ**<br>**KLUF-KFRO-KMAC-KVRS** | 1370 |  | **WMFO-WAGF-**<br>‡**WGL-WGRC-**<br>**WPAY-WHBQ-**<br>**WHLS** |
| ***KOH** Reno, Nev..........M | ***WKBH** La Crosse, Wis.....O | 1380 |  | **WSMK** Dayto<br>‡**WALA** Mobile |
| **KRLC** Lewiston, Ida..K<br>***KOY** Phoenix, Aris.........O | ***KLRA** Little Rock, Ark....O | 1390 |  | ↓▲**WHK** Clevela |
| ↓**KLO** Ogden, U..(***KHBC**) M | ***KTUL** Tulsa, Okla........O | 1400 |  | †**WIRE** Indiana |
| ‡**KMED** Medford, Ore.......K<br>‡**KGNC** Amarillo, Tex.......O | **KFJM** Grand Forks, N.D..M<br>**WROK** Rockford, Ill.......M | 1410 |  | **WBCM** Bay Ci<br>***WSFA** Montg |
| **KUMA-KSAN-KRBM**▲**KORE**<br>**KBPS-KXL-KEUB-KGIW**<br>**KIDW-KWBG-KRLH-KATE**<br>**KVAK** | **KCMC-KLBM-WJBO-WMBH**<br>▲**KGFF-KABR-KRBC-KNET**<br>**KIUN-KABC***WACO-KFIZ**<br>**KDNT-KFAM-KRIC-KTRI** | 1420 |  | **WMSD-WHFC**<br>**WPAD**↓**WELL-**<br>**WAPO***WPAR** |
| **KINY** Juneau, Alaska.....K<br>↓**KECA** Los Angeles, Cal....O | ↓▲**KSO** Des Moines, Ia......K<br>**KGNF** No. Platte, Neb.....O | 1430 |  | ***WBNS** Colum<br>↓**WMPS** Memp |
| ▲**KELA** Centralia, Wash....M<br>**KDFN** Casper, Wyo.......M | ***WMBD** Peoria, Ill.........O<br>↓**KXYZ** Houston, Tex.......O | 1440 |  | ***WBIG** Greens |
| ▲**KIEM** Eureka, Cal........M<br>**KGCX** Wolf Point, Mont...O | **KCMO** Kansas City, Mo...O<br>‡**KTBS** Shreveport, La......O | 1450 |  | ***WGAR** Clevela<br>↓**WAGA** Atlant |
|  | †**KSTP** St. Paul, Minn......T | 1460 |  |  |
| ↓**KGA** Spokane, Wash......S |  | 1470 |  | ***WLAC** Nashvi |
|  | ***KOMA** Okla. City, Okla....S | 1480 |  | **WHIP** Hamm |
| ‡**KFBK** Sacramento, Cal....T |  | 1490 |  | ‡**WCKY** Cincin |
| **KSAM-KBKR-KROD-KYCA**<br>▲**KPQ**▲**KXO**▲**KVOE**▲**KDB**<br>**KAWM-KOVC**▲**KRNR-KUTA**<br>**KSAL-KWEW-KVWC** | **KOTN***WKBB-WTMV-KPAB**<br>**KPLC***KDAL-KGKY**▲**KBIX**<br>***KNOW-KBST-KNEL-KGFI**<br>**KYSM-KPLT-KGKB-WGIL** | 1500 |  | **WHBB-WKBV-**<br>**WOMI-WCPI-** |
|  |  | 1510 |  | **CKCR** Waterl |
|  | **KITE** Kansas City, Mo..... O | 1530 |  |  |
| ▲**KPMC** Bakersfield, Cal . O |  | 1550 |  |  |

100 250 300 500 750 1000 1500 2000 2500 5000 WATTS POWER 10000 15000 25000 50000 100,000 250,000 500,000
H K L M N O P Q R S CODE T U V W X Y Z

Revision 59 *Columbia; †NBC Red; ⸸NBC Blue; ‡NBC Red & Blue; ▲Mutual

| WESTERN<br>*Wash., Ore., Cal., Utah, Etc.* | MIDDLE WESTERN<br>*Minn., Ia., Neb., Mo., Tex., Etc* | KILO. | Dial No. | CENTRAL<br>*Ill., Mich., Ohio, Tenn., Etc.* | EASTERN<br>*Mass., N. Y., Pa., N. C., Etc.* |
|---|---|---|---|---|---|
| **CJRM** Moose Jaw, Sask....O | | 540 | | | |
| **KOAC** Corvallis, Ore.......O<br>‡**KFYR** Bismarck, N. D.....O | †**KSD-KFUO** St. Louis, Mo. O<br>***KTSA** San Antonio, Tex...O | 550 | | ***WKRC** Cincinnati, Ohio....O<br>**WSVA** Staunton, Va......M | **CFNB** Fredericton, N.B. M<br>***WGR** Buffalo, N. Y........O<br>**WDEV** Waterbury Vt......M |
| ***KLZ** Denver, Colo.........O<br>***KSFO** San Francisco, Cal..O | **KWTO** Springfield, Mo.... O<br>‡**KFDM** Beaumont, Tex.....O | 560 | | **WIND** Chicago-Gary.......O<br>‡**WIS** Columbia, S.C.........O | ⸸▲**WFIL** Philadelphia, Pa... O<br>***WQAM** Miami, Fla.........O |
| ***KVI** Tacoma, Wash........O<br>**KMTR** Los Angeles, Cal...O | ***WNAX** Yankton, S. D.....O<br>‡**KGKO** Ft. Worth, Tex....O | 570 | | ***WKBN** Youngstown, Ohio. M<br>**WOSU** Columbus, Ohio....O | ‡**WWNC** Asheville, N.C.....O<br>**WMCA** New York (⸸**WSYR**) O |
| **CKUA** Edmonton, Alta....M<br>‡**KMJ** Fresno, Cal..........O | ***WIBW** Topeka, Kas.......O<br>**KSAC** Manhattan, Kas....M | 580 | | **WILL** Urbana, Ill..........O<br>***WCHS** Charleston, W. Va..M | †**WTAG** Worcester, Mass....O<br>***WDBO** Orlando, Fla.......O |
| †**KHQ** Spokane, Wash......O | †**WOW** Omaha, Neb.........S | 590 | | **WKZO** Kalamazoo, Mich...K | ***WEEI** Boston, Mass........O |
| **CJOR** Vancouver.B C.....M<br>⸸**KFSD** San Diego, Cal.....M | ⸸▲**WMT** Cedar Rapids, Ia ..O<br>***WREC** Memphis, Tenn....O | 600 | | ⸸**CFCF** Montreal, Que......M<br>**CBW** Windsor. Ont........M<br>**CMQ** Havana, Cuba..V | ⸸▲**WICC** Bridgeport, Conn . M<br>***WCAO** Baltimore, Md.... M |
| **KFAR** Fairbanks, Alaska...O<br>▲**KFRC** San Francisco, Cal...O | †**WDAF** Kansas City, Mo....O | 610 | | ▲**WCLE** Cleveland, Ohio.....M | **WIP** Philadelphia, Pa..... O<br>‡**WIOD** Miami, Fla.........O |
| †**KGW** Portland, Ore.........O<br>‡**KTAR** Phoenix, Ariz.......O | **KWFT** Wichita Falls, Tex...K | 620 | | ‡**WTMJ** Milwaukee, Wis....O<br>‡**WFLA**-‡**WSUN** Florida....O | *▲**WLBZ** Bangor, Maine....O<br>**WHJB** Greensburg, Pa .....K |
| **CJRC** Winnipeg, Man..... [illegible]<br>**KGFX** Pierre, S.D.........J | **KFRU** Columbia, Mo......M | 630 | | ‡**WGBF** Evansville, Ind.....M<br>⸸**WMAL** Washington, D. C. K | **CFCY** Charlottetown, PEI..O<br>***WPRO** Providence, R. I... M |
| †**KFI** Los Angeles, Cal ....W | **WOI** Ames, Iowa..........S | 640 | | ▲**WHKC** Columbus, Ohio...M | ***WGAN** Portland, Me..... M |
| | | 650 | | ‡▲**WSM** Nashville, Tenn...W | |
| | **WAAW** Omaha, Nebr......M | 660 | | **XEAL** Mexico City, Mex...O | †**WEAF** New York City...W |
| | | 670 | | †**WMAQ** Chicago, Ill..... W | |
| †**KPO** San Francisco, Cal..W | **KFEQ** St. Joseph, Mo......R | 680 | | **CMBQ** Havana, Cuba......S | **WLAW** Lawrence, Mass..O<br>‡**WPTF** Raleigh, N. C.......O |
| **CJCJ** Calgary, Alta.......M | **XET** Monterey, Mex........S | 690 | | **NAA** Arlington, Va.........O | ***CFRB** Toronto, Ont........S |
| | | 700 | | ▲‡**WLW** Cincinnati, Ohio..Z | |
| ***KIRO** Seattle, Wash...... O<br>**KMPC** Beverly Hills, Cal M | | 710 | | | ▲**WOR** Newark, N. J.......W |
| | | 720 | | ▲**WGN** Chicago, Ill.......W | |
| **CJCA** Edmonton, Alta.....O | **XEPN** Pedras Negras, Mex. W | 730 | | **CMCL** Havana, ..(**CMK**) . T | ***CKAC** Montreal, Que....S |
| **KTRB** Modesto, Cal.......K | **KMMJ** Clay Center, Neb..O | 740 | | †**WSB** Atlanta, Ga.......W | **WHEB** Portsmouth, N. H..K |
| ‡**KGU** Honolulu, Hawaii....R | | 750 | | ***WJR** Detroit, Mich. ....W | **CMBL** Havana, Cuba......R |
| **KXA** Seattle, Wash........O<br>**XEOK** Tia Juana, Mex....K | **WLB** Minneapolis (**WCAL**) . S<br>**WEW** St. Louis, Mo........O | 760 | | | ⸸**WJZ** New York (**WBAL**) W |
| | ***KFAB** Lincoln, Nebr.....T | 770 | | ***WBBM** Chicago, Ill.....W | **CMBF** Havana, Cuba......S |
| **KWLK** Longview, Wash... K<br>**KEHE** Los Angeles, Cal....O | ‡**KGHL** Billings, Mont......O<br>**KFDY** Brookings, S. D.....O | 780 | | **WPIC** Sharon, Pa.........K<br>†**WMC** Memphis, Tenn......O | ⸸▲**WEAN** Providence, R.I...O<br>‡**WTAR** Norfolk, Va.......O |
| ⸸**KGO** San Francisco, Cal..T | ‡**KOAM** Pittsburg, Kas.....Q | 790 | | | †**WGY** Schenectady, N. Y. W |
| | ‡**WFAA** Dallas, (‡**WBAP**). W | 800 | | **HIX** Santo Domingo, RD...O | **WTBO** Cumberland, Md..K |
| | ***WCCO** Minneapolis, Min W | 810 | | | **WNYC** New York City.... O |
| **XEBG** Tia Juana, Mex....O | | 820 | | ***WHAS** Louisville, Ky... W | |
| | ⸸**KOA** Denver, Colo.......W | 830 | | **WRUF** Gainesville, Fla.....S | **WHDH** Boston, Mass......O<br>**WEEU** Reading, Pa........O |
| **CFQC** Saskatoon, Sask.....O | **XERA** Villa Acuna, Mex. ...Z | 840 | | | ‡**CBL-CBT** Toronto, Ont. W |
| **KIEV** Glendale, Cal.......K | ***WWL** New Orleans, La...W | 850 | | **WKAR** E. Lansing, Mich...O | ***WESG** Elmira, N.Y.......O |
| **XEMO** Tiajuana, Mex.....S | ▲**WHB** Kansas City, Mo....O | 860 | | | ***WABC** New York......W |
| | | 870 | | ⸸**WENR-WLS** Chicago..W | |
| **KLX** Oakland, Cal........O | **WSUI** Iowa City, Ia. M<br>**KPOF** Denver..(***KFKA**) O | 880 | | **CBO** Ottawa, Ont.........O<br>***WCOC** Meridian, Miss.....O | ***WGBI-WQAN** Scranton, Pa O<br>**WRNL** Richmond, Va.... M |
| ***KFPY** Spokane, Wash...O<br>‡**KARK** Little Rock, Ark....M | **KFNF** Shenandoah (**KUSD**) O<br>**XEW** Mexico City........W | 890 | | **WBAA** Lafayette, Ind.....M<br>***WMMN** Fairmont, W. Va..O | †**WJAR** Providence, R. I....M<br>***WGST** Atlanta, Ga........O |
| **KGBU** Ketchikan, Alaska O<br>‡**KSEI** Pocatello, Idaho.....K<br>▲**KHJ** Los Angeles, Cal....O | **WTAD** Quincy, Ill.........O<br>‡**WKY** Okla. City, Okla.....O | 900 | | **WLBL** Stevens Pt., Wis...S<br>‡**WJAX** Jacksonville, Fla....O | †**WBEN** Buffalo, N. Y.......O<br>**WELI** New Haven, Conn..M |
| **CJAT** Trail, B.C...........O | **XENT** Nueve Laredo, Mex . X | 910 | | **CKY** Winnipeg, Man......U | ‡**CBF** Montreal, Que......W |
| †**KOMO** Seattle, Wash......O | †**KPRC** Houston, Texas.....O<br>▲**KFEL**⸸**KVOD** Denver.....M | 920 | | †**WWJ** Detroit, Mich.......S<br>**WAAF** Chicago, Ill.........O<br>**CMX** Havana.....T | **WORL** Boston, Mass......M<br>**WPEN** Philadelphia, Pa....O |
| **CFAC** Calgary, Alta.......O<br>**KROW** Oakland, Cal.......O | ⸸**KMA** Shenandoah, Ia......O | 930 | | †**WBRC** Birmingham, Ala...O | **CHNS** Halifax, N.S.......M<br>***WDBJ** Roanoke, Va.......O |
| ***KOIN** Portland, Ore.........O | ‡**WDAY** Fargo, N. D........O<br>**WHA** Madison, Wis........S | 940 | | ‡**WAVE** Louisville, Ky......O<br>**XEFO** Mexico City, Mex...S | †**WCSH** Portland, Maine....O<br>**WAAT** Jersey City, N. J...M |
| **KFWB** Hollywood, Cal....O | ***KMBC** Kansas City, Mo...O | 950 | | **WHAL** Saginaw, Mich.... M<br>**CMBC** Havana, Cuba......P | **CBV** Quebec Que..........O<br>†**WRC** Washington, D.C....O |
| | **XEAW** Reynosa, Tams.... X | 960 | | **CRCY** Toronto, Ont. ......H | **CHNC** New Carlisle, Que..O |
| ⸸**KJR** Seattle, Wash........S | | 970 | | ‡**WCFL** Chicago, Ill........S | **WIBG** Glenside, Pa.......H |
| | | 980 | | | ⸸**KDKA** Pittsburgh, Pa...W |
| | **XEAF** Nogales, Mexico....N | 990 | | | ⸸**WBZ-WBZA** Boston...W |
| **KFVD** Los Angeles, Cal...O | †**WHO** Des Moines, Iowa. W | 1000 | | | |
| **CKCK** Regina, Sask........O<br>▲**KQW** San Jose, Cal.......O | ▲**KGGF** Coffeyville, Kas....O<br>**WNAD** Norman, Okla.....O | 1010 | | ***WNOX** Knoxville, Tenn....O | **WHN** New York City......O |
| | **XEJ** Juarez, Mex.........O | 1020 | | **WDZ** Tuscola, Ill..........K | †**KYW** Philadelphia, Pa...T |
| **CFCN** Calgary, Alta. ....T | **XEB** Mexico City, Mex...Y | 1030 | | ▲**CKLW** Windsor-Detroit....S | **CMCK** Havana, Cuba.....S |
| **KWJJ** Portland, Ore.......M<br>**KYOS** Merced, Cal.........K | ***KRLD** Dallas, Tex.......T | 1040 | | | †**WTIC** Hartford, Conn...W |
| ***KNX** Los Angeles, Cal ..W | **WEAU** Eau Claire, Wis.....O<br>**KFBI** Abilene, Kas.......S | 1050 | | **WIBC** Indianapolis, Ind...O | †**CBM** Montreal, Que......S |

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|---|---|---|---|---|
| **WJAG** Norfolk, Nebr......O | ‡**KTHS** Hot Springs, Ark..T | 1060 | | |
| **KJBS** San Francisco, Cal.. M | **WCAZ** Carthage, Ill. ......H | 1070 | | †**WTAM** Clev |
| | | 1080 | | **WMBI-WCBD** |
| | ***KMOX** St. Louis, Mo... W | 1090 | | |
| **CBR** Vancouver, B. C......S<br>▲**KGDM** Stockton, Cal......O | ***KWKH** Shreveport, La. ...T | 1100 | | |
| | **KSOO** Sioux Falls, S. D....S | 1110 | | **XELO** Piedras |
| **KFIO** Spok'e, Wash. (**KRSC**) H<br>**KFSG-KRKD** Los Angeles M | **CKX** Brandon, Man.........O<br>**WTAW** College Station, Tex M<br>**KTBC** Austin, Tex...O | 1120 | | ***WISN** Milwauk<br>⸸**WJBO** Baton |
| ***KSL** Salt Lake City, Utah. W | | 1130 | | **WJJD** Chicago, |
| | ‡**KVOO** Tulsa, Okla......V | 1140 | | ***WAPI** Birmingh |
| | **XEH** Monterey, Mex......K | 1150 | | |
| | **XED** Guadalajara, Mex....M | 1160 | | ⸸**WOWO** Ft. Wa |
| | | 1170 | | |
| ⸸**KEX** Portland, Ore.........S<br>‡**KOB** Albuquerque, N.M...T | ▲**WDGY** Minneapolis, Minn.. O | 1180 | | ***WMAZ** Macon, |
| **KTKC** Viscalia, Cal........K | ‡**WOAI** San Antonio, Tex. W | 1190 | | **WSAZ** Hunting |
| **KSUN-KGFJ-KVCV**▲**KVEC**<br>‡**KWG-KFXD-KDNC**▲**KOOS**<br>▲**KVOS**‡**KELO-KGVL-KFXJ**<br>**KGCI-KVNU-KAST** | **KBTM-KGHI-KGEK**<br>**KFJB-KMLB-WBNO-WJBW**<br>**KWNO-KGDE-WIL**<br>▲**KADA-WBBZ-WCAT-WDSM** | 1200 | | **WJHL**<br>**WBHP-WJRD-**<br>**WWAE-WFAM-**<br>**WCPO-WHBY-** |
| **KGLU**<br>▲**KDON-KPPC***KROY**▲**KFXM**<br>‡**KPFA-KLAH-KFJI**▲**KGY**<br>**KHBG**▲**KASA-KWTN-KWJB** | **KFPW-WHBF***KGLO-KIUL**<br>**KANS***WMFG-WGRM-WGCM**<br>**KFVS**▲**KFOR-KDLR**▲**KVSO**<br>**KALB-WJMC-KOCA-WIBU** | 1210 | | **WJBY-WCRW-**<br>**WEBQ-WTAX-**<br>**WJW**‡**WCOL-**<br>**WSIX-WCOV-** |
| **KTW** Seattle...(**KWSC**)...O | ⸸**WREN-KFKU** Kansas City O | 1220 | | ***WDAE** Tampa, |
| **CJOC** Lethbridge, Alta.....H<br>**KYA** San Francisco, Cal....O | ‡**KGBX** Springfield, Mo....M<br>**KGGM** Albuquerque, N.M. O | 1230 | | ***WFBM** Indiana |
| **KGCU** Manden No. Dakota K<br>‡**KTFI** Twin Falls, Idaho...M | ▲**KTAT** Ft. Worth, Tex.....O | 1240 | | ⸸**WXYZ** Detroit.<br>**XEKL** Leon, M |
| ▲**KIT** Yakima, Wash.......M<br>**KFOX** Long Beach, Cal...O | ⸸**WTCN** Minneapolis, Minn..O<br>**KXOK** St. Louis, Mo.......O | 1250 | | **WEST** New Ca<br>⸸**WDSU** New Or |
| ▲**KGVO** Missoula, Mont....O<br>**KVOA** Tucson, Arizona....O<br>**KHSL** Chico, Cal......K | ⸸▲**KOIL** Omaha, Nebr......O<br>**KPAC** Port Arthur (‡**KRGV**) O | 1260 | | ***WHIO** Dayton,<br>***WTOC** Savann |
| ▲**KOL** Seattle, Wash.........O | **KWLC-KGCA** Decorah, Ia H<br>***KVOR** Colo. Springs, Colo..O | 1270 | | ⸸**WOOD-WASH**<br>†**WJDX** Jackson |
| ‡**KFBB** Great Falls, Mont...O<br>**KLS** Oakland, Cal.........K | ‡**WIBA** Madison, Wis.......O<br>▲**WRR** Dallas, Tex..........M | 1280 | | ***WDOD** Chattan |
| ‡**KDYL** Salt Lake City......O | ‡**WEBC** Duluth, Minn......O<br>***KTRH** Houston, Tex.......O | 1290 | | ***WJAS** Pittsbur |
| **KALE** Portland, Ore.......O<br>**KFAC** Los Angeles, Cal....O | **WHBL** Sheboygan, Wis....M<br>***KFH** Wichita, Kas.........O | 1300 | | ‡**WFBC** Greenv |
| ▲**KARM-KCRJ-KSRO KHUB**<br>**KGEZ-KRQA-KSUB-KPDN**<br>▲**KXRO-KGFW-KBND** | **KCKN-KVOL-KRMD-KOME**<br>**KVOX-KROC-KRBA-KWOS**<br>**KWOC-KRRV-KOCY-KAND**<br>**KFPL**‡**KTSM-WDAH-KFYO** | 1310 | | ⸸**WSGN-WGAU-**<br>**WCLS-WTRC-**<br>**WCMI**⸸**WFDF-**<br>**WTJS**‡**WROL-** |
| **KID** Idaho Falls, Idaho....M<br>*▲**KGMB** Honolulu........O | ***KRNT** Des Moines, Iowa...O<br>‡**KGHF** Pueblo, Colo........M | 1320 | | ***WADC** Akron,<br>†**WSMB** New O |
| ▲**KMO** Tacoma, Wash.......O<br>▲**KGB** San Diego, Cal.......O | ***KSCJ** Sioux City, Ia.......O<br>‡**KRIS** Corpus Christi, Tex...M | 1330 | | ***WTAQ** Green<br>‡▲**WSAI** Cincinn |
| ‡**KGIR** Butte, Mont.........M | **KDTH** Dubuque, Iowa....M<br>**KGNO** Dodge City, Kas....K | 1340 | | ⸸**WSPD** Toledo,<br>***WCOA** Pensaco |
| ‡**KIDO** Boise, Idaho........O | ⸸▲**KWK** St. Louis, Mo.......O | 1350 | | †**WMBG** Richm |
| **KLPM** Minot, N. D.......M<br>**KGER** Long Beach, Cal....O | ▲**KCRC** Enid, Okla.........K<br>**WQBC** Vicksburg, Miss....O | 1360 | | **WGES** Chicago<br>***WSBT** South B |
| ***KGAR**‡**KERN-KRE-KICA**<br>**KGFL**▲**KSLM-KOBH**<br>**KRKO-KEEN-KUJ-KWYO**<br>**KIUP-KOKO-KGKL-KRMC** | **KELD-KONO-KTEM-KFGQ**<br>***WOC-KVGB-WMIN***WHLB**<br>**WFOR**▲**KTOK-KFJZ**<br>**KLUF-KFRO-KMAC-KVRS** | 1370 | | **WMFO-WAGF-**<br>‡**WGL-WGRC-**<br>**WPAY-WHBQ-**<br>**WHLS** |
| ***KOH** Reno, Nev..........M<br>**KRLC** Lewiston, Ida..K | ***WKBH** La Crosse, Wis.....O | 1380 | | **WSMK** Dayton<br>‡**WALA** Mobile |
| ***KOY** Phoenix, Ariz........O | ***KLRA** Little Rock, Ark....O | 1390 | | ⸸▲**WHK** Clevela |
| ⸸**KLO** Ogden, U..(***KHBC**) M | ***KTUL** Tulsa, Okla.........O | 1400 | | †**WIRE** Indiana |
| ‡**KMED** Medford, Ore......K<br>‡**KGNC** Amarillo, Tex......O | **KFJM** Grand Forks, N.D..M<br>**WROK** Rockford, Ill.......M | 1410 | | **WBCM** Bay Ci<br>***WSFA** Montg |
| **KUMA-KSAN-KRBM**▲**KORE**<br>**KBPS-KXL-KEUB-KGIW**<br>**KIDW-KWBG-KRLH-KATE**<br>**KVAK** | **KCMC-KLBM-WJBO-WMBH**<br>▲**KGFF-KABR-KRBC-KNET**<br>**KIUN-KABC***WACO-KFIZ**<br>**KDNT-KFAM-KRIC-KTRI** | 1420 | | **WMSD-WHFC-**<br>**WPAD**⸸**WELL-**<br>**WAPO***WPAR-** |
| **KINY** Juneau, Alaska.....K<br>⸸**KECA** Los Angeles, Cal....O | ⸸▲**KSO** Des Moines, Ia......K<br>**KGNF** No. Platte, Neb.....O | 1430 | | ***WBNS** Columb<br>⸸**WMPS** Memph |
| ▲**KELA** Centralia, Wash....M<br>**KDFN** Casper, Wyo.......M | ***WMBD** Peoria, Ill........O<br>⸸**KXYZ** Houston, Tex.......O | 1440 | | ***WBIG** Greensb |
| ▲**KIEM** Eureka, Cal.......M<br>**KGCX** Wolf Point, Mont...O | **KCMO** Kansas City, Mo...O<br>‡**KTBS** Shreveport, La......O | 1450 | | ***WGAR** Clevela<br>⸸**WAGA** Atlanta |
| | †**KSTP** St. Paul, Minn......T | 1460 | | |
| ⸸**KGA** Spokane, Wash......S | | 1470 | | ***WLAC** Nashvil |
| | ***KOMA** Okla. City, Okla....S | 1480 | | **WHIP** Hammo |
| ‡**KFBK** Sacramento, Cal....T | | 1490 | | ‡**WCKY** Cincinn |
| **KSAM-KBKR-KROD-KYCA**<br>▲**KPQ**▲**KXO**▲**KVOE**▲**KDB**<br>**KAWM-KOVC**▲**KRNR-KUTA**<br>**KSAL-KWEW-KVWC** | **KOTN***WKBB-WTMV-KPAB**<br>**KPLC***KDAL-KGKY**▲**KBIX**<br>***KNOW-KBST-KNEL-KGFI**<br>**KYSM-KPLT-KGKB-WGIL** | 1500 | | **WHBB-WKBV-**<br>**WOMI-WOPI-** |
| | | 1510 | | **CKCR** Waterlo |
| | **KITE** Kansas City, Mo.....O | 1530 | | |
| ▲**KPMC** Bakersfield, Cal ..O | | 1550 | | |

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Revision 59 *Columbia; †NBC Red; ⸸NBC Blue; ‡NBC Red & Blue; ▲Mutual

| WESTERN<br>*Wash., Ore., Cal., Utah, Etc.* | MIDDLE WESTERN<br>*Minn., Ia., Neb., Mo., Tex., Etc* | KILO. | Dial No. | CENTRAL<br>*Ill., Mich., Ohio, Tenn., Etc.* | EASTERN<br>*Mass., N. Y., Pa., N. C., Etc.* |
|---|---|---|---|---|---|
| CJRM Moose Jaw, Sask....O | | 540 | | | CFNB Fredericton, N.B. M |
| KOAC Corvallis, Ore.......O<br>‡KFYR Bismarck, N. D.....O | †KSD-KFUO St. Louis, Mo. O<br>*KTSA San Antonio, Tex...O | 550 | | *WKRC Cincinnati, Ohio....O<br>WSVA Staunton, Va.......M | *WGR Buffalo, N. Y.........O<br>WDEV Waterbury Vt.......M |
| *KLZ Denver, Colo..........O<br>*KSFO San Francisco, Cal..O | KWTO Springfield, Mo.....O<br>‡KFDM Beaumont, Tex.....O | 560 | | WIND Chicago-Gary.......O<br>‡WIS Columbia, S.C.........O | ⸸▲WFIL Philadelphia, Pa...O<br>*WQAM Miami, Fla.........O |
| *KVI Tacoma, Wash.........O<br>▲KMTR Los Angeles, Cal...O | *WNAX Yankton, S. D.....O<br>‡KGKO Ft. Worth, Tex.....O | 570 | | *WKBN Youngstown, Ohio. M<br>WOSU Columbus, Ohio....O | ‡WWNC Asheville, N.C.....O<br>WMCA New York (⸸WSYR) O |
| CKUA Edmonton, Alta....M<br>‡KMJ Fresno, Cal............O | *WIBW Topeka, Kas........O<br>KSAC Manhattan, Kas....M | 580 | | WILL Urbana, Ill..........O<br>*WCHS Charleston, W. Va..M | †WTAG Worcester, Mass....O<br>*WDBO Orlando, Fla.......O |
| †KHQ Spokane, Wash.......O | †WOW Omaha, Neb.........S | 590 | | WKZO Kalamazoo, Mich...K | *WEEI Boston, Mass........O |
| CJOR Vancouver, B C.....M<br>⸸KFSD San Diego, Cal.....M | ⸸▲WMT Cedar Rapids, Ia ..O<br>*WREC Memphis, Tenn....O | 600 | | ⸸CFCF Montreal, Que......M<br>CBW Windsor, Ont........M<br>CMQ Havana, Cuba..V | ⸸▲WICC Bridgeport, Conn . M<br>*WCAO Baltimore, Md.... M |
| KFAR Fairbanks, Alaska...O<br>▲KFRC San Francisco, Cal...O | †WDAF Kansas City, Mo....O | 610 | | ▲WCLE Cleveland, Ohio.....M | WIP Philadelphia, Pa.....O<br>‡WIOD Miami, Fla..........O |
| †KGW Portland, Ore........O<br>‡KTAR Phoenix, Ariz.......O | KWFT Wichita Falls, Tex...K | 620 | | ‡WTMJ Milwaukee, Wis....O<br>‡WFLA-‡WSUN Florida...O | *▲WLBZ Bangor, Maine....O<br>WHJB Greensburg, Pa .....K |
| CJRC Winnipeg, Man..... [illegible]<br>KGFX Pierre, S.D.......... [illegible] | KFRU Columbia, Mo......M | 630 | | ‡WGBF Evansville, Ind.....M<br>⸸WMAL Washington, D. C. K | CFCY Charlottetown, PEI..O<br>*WPRO Providence, R. I... M |
| †KFI Los Angeles, Cal ....W | WOI Ames, Iowa...........S | 640 | | ▲WHKC Columbus, Ohio...M | *WGAN Portland, Me..... M |
| | | 650 | | ‡▲WSM Nashville, Tenn...W | |
| | WAAW Omaha, Nebr......M | 660 | | XEAL Mexico City, Mex...O | †WEAF New York City...W |
| | | 670 | | †WMAQ Chicago, Ill..... W | |
| †KPO San Francisco, Cal..W | KFEQ St. Joseph, Mo......R | 680 | | CMBQ Havana, Cuba.....S | WLAW Lawrence, Mass..O<br>‡WPTF Raleigh, N. C.......O |
| CJCJ Calgary, Alta.......M | XET Monterey, Mex........S | 690 | | NAA Arlington, Va.........O | *CFRB Toronto, Ont........S |
| | | 700 | | ▲‡WLW Cincinnati, Ohio..Z | |
| *KIRO Seattle, Wash...... O<br>KMPC Beverly Hills, Cal M | | 710 | | | ▲WOR Newark, N. J.......W |
| | | 720 | | ▲WGN Chicago, Ill. .....W | |
| CJCA Edmonton, Alta.....O | XEPN Pedras Negras, Mex. W | 730 | | CMCL Havana, ..(CMK) .T | *CKAC Montreal, Que....S |
| KTRB Modesto, Cal.......K | KMMJ Clay Center, Neb..O | 740 | | †WSB Atlanta, Ga........W | WHEB Portsmouth, N. H..K |
| ‡KGU Honolulu, Hawaii....R | | 750 | | *WJR Detroit, Mich. ....W | CMBL Havana, Cuba......R |
| KXA Seattle, Wash........O<br>XEOK Tia Juana, Mex....K | WLB Minneapolis (WCAL) .S<br>WEW St. Louis, Mo........O | 760 | | | ⸸WJZ New York (WBAL) W |
| | *KFAB Lincoln, Nebr.....T | 770 | | *WBBM Chicago, Ill.....W | CMBF Havana, Cuba......S |
| KWLK Longview, Wash...K<br>KEHE Los Angeles, Cal....O | ‡KGHL Billings, Mont......O<br>KFDY Brookings, S. D.....O | 780 | | WPIC Sharon, Pa.........K<br>†WMC Memphis, Tenn......O | ⸸▲WEAN Providence, R.I...O<br>‡WTAR Norfolk, Va........O |
| ⸸KGO San Francisco, Cal..T | ‡KOAM Pittsburg, Kas.....O | 790 | | | †WGY Schenectady, N. Y. W |
| | ‡WFAA Dallas, (‡WBAP) .W | 800 | | HIX Santo Domingo, RD...O | WTBO Cumberland, Md...K |
| | *WCCO Minneapolis, Min W | 810 | | | WNYC New York City.... O |
| XEBG Tia Juana, Mex....O | | 820 | | *WHAS Louisville, Ky... W | |
| | ⸸KOA Denver, Colo.......W | 830 | | WRUF Gainesville, Fla.....S | WHDH Boston, Mass......O<br>WEEU Reading, Pa........O |
| CFQC Saskatoon, Sask.....O | XERA Villa Acuna, Mex. ...Z | 840 | | | ‡CBL-CBT Toronto, Ont. W |
| KIEV Glendale, Cal.......K | *WWL New Orleans, La...W | 850 | | WKAR E. Lansing, Mich...O | *WESG Elmira, N.Y........O |
| XEMO Tiajuana, Mex.....S | ▲WHB Kansas City, Mo....O | 860 | | | *WABC New York......W |
| | | 870 | | ⸸WENR-WLS Chicago.. W | |
| KLX Oakland, Cal. O | WSUI Iowa City, Ia. M<br>KPOF Denver..(*KFKA) O | 880 | | CBO Ottawa, Ont.........O<br>*WCOC Meridian, Miss.....O | *WGBI-WQAN Scranton, Pa O<br>WRNL Richmond, Va. M |
| *KFPY Spokane, Wash...O<br>‡KARK Little Rock, Ark....M | KFNF Shenandoah (KUSD) O<br>XEW Mexico City.......W | 890 | | WBAA Lafayette, Ind.....M<br>*WMMN Fairmont, W. Va.. O | †WJAR Providence, R. I....M<br>*WGST Atlanta, Ga........O |
| KGBU Ketchikan, Alaska O<br>‡KSEI Pocatello, Idaho....K<br>▲KHJ Los Angeles, Cal...O | WTAD Quincy, Ill.......O<br>‡WKY Okla. City, Okla.....O | 900 | | WLBL Stevens Pt., Wis...S<br>‡WJAX Jacksonville, Fla....O | †WBEN Buffalo, N. Y.......O<br>WELI New Haven, Conn..M |
| CJAT Trail, B.C........O | XENT Nueve Laredo, Mex. X | 910 | | CKY Winnipeg, Man.......U | ‡CBF Montreal, Que......W |
| †KOMO Seattle, Wash. ...O | †KPRC Houston, Texas....O<br>▲KFEL⸸KVOD Denver.....M | 920 | | †WWJ Detroit, Mich.......S<br>WAAF Chicago, Ill........O<br>CMX Havana.....T | WORL Boston, Mass......M<br>WPEN Philadelphia, Pa....O |
| CFAC Calgary, Alta.......O<br>KROW Oakland, Cal.....O | ⸸KMA Shenandoah, Ia......O | 930 | | †WBRC Birmingham, Ala....O | CHNS Halifax, N S........M<br>*WDBJ Roanoke, Va........O |
| *KOIN Portland, Ore.......O | ‡WDAY Fargo, N. D.......O<br>WHA Madison, Wis.......S | 940 | | ‡WAVE Louisville, Ky......O<br>XEFO Mexico City, Mex...S | †WCSH Portland, Maine....O<br>WAAT Jersey City, N. J...M |
| KFWB Hollywood, Cal....O | *KMBC Kansas City, Mo...O | 950 | | WHAL Saginaw, Mich. ... M<br>CMBC Havana, Cuba......P | CBV Quebec Que..........O<br>†WRC Washington, D.C....O |
| | XEAW Reynosa, Tams....X | 960 | | CRCY Toronto, Ont. ......H | CHNC New Carlisle, Que..O |
| ⸸KJR Seattle, Wash.......S | | 970 | | ‡WCFL Chicago, Ill.........S | WIBG Glenside, Pa.......H |
| | | 980 | | | ⸸KDKA Pittsburgh, Pa...W |
| | XEAF Nogales, Mexico....N | 990 | | | ⸸WBZ-WBZA Boston... W |
| KFVD Los Angeles, Cal...O | †WHO Des Moines, Iowa. W | 1000 | | | |
| CKCK Regina, Sask.......O<br>▲KQW San Jose, Cal.......O | ▲KGGF Coffeyville, Kas....O<br>WNAD Norman, Okla.....O | 1010 | | *WNOX Knoxville, Tenn....O | WHN New York City......O |
| | XEJ Juarez, Mex.........O | 1020 | | WDZ Tuscola, Ill..........K | †KYW Philadelphia, Pa...T |
| CFCN Calgary, Alta.....T | XEB Mexico City, Mex....Y | 1030 | | ▲CKLW Windsor-Detroit....S | CMCK Havana, Cuba.....S |
| KWJJ Portland, Ore.......M<br>KYOS Merced, Cal.......K | *KRLD Dallas, Tex.......T | 1040 | | | †WTIC Hartford, Conn...W |
| *KNX Los Angeles, Cal ..W | WEAU Eau Claire, Wis...O<br>KFBI Abilene, Kas.......S | 1050 | | WIBC Indianapolis, Ind...O | †CBM Montreal, Que......S |

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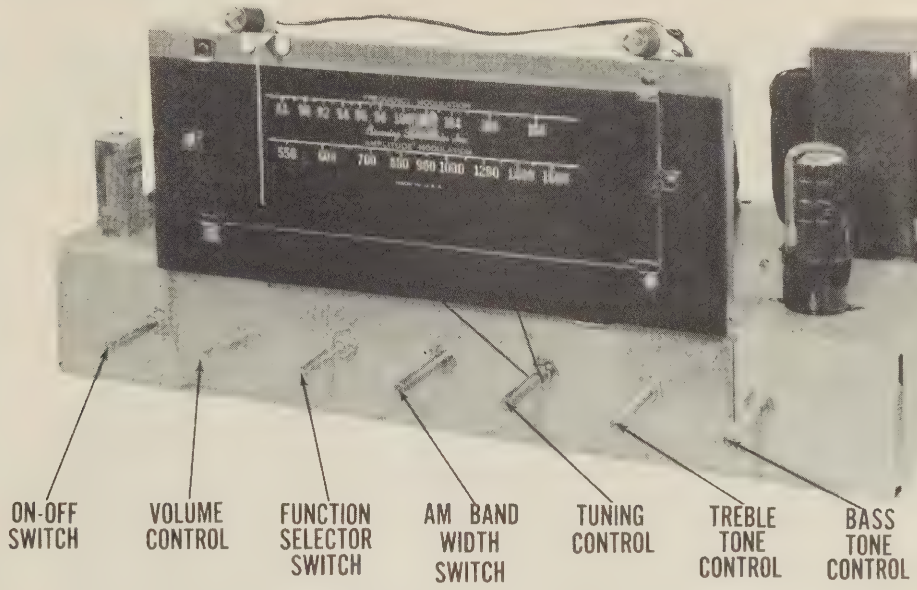
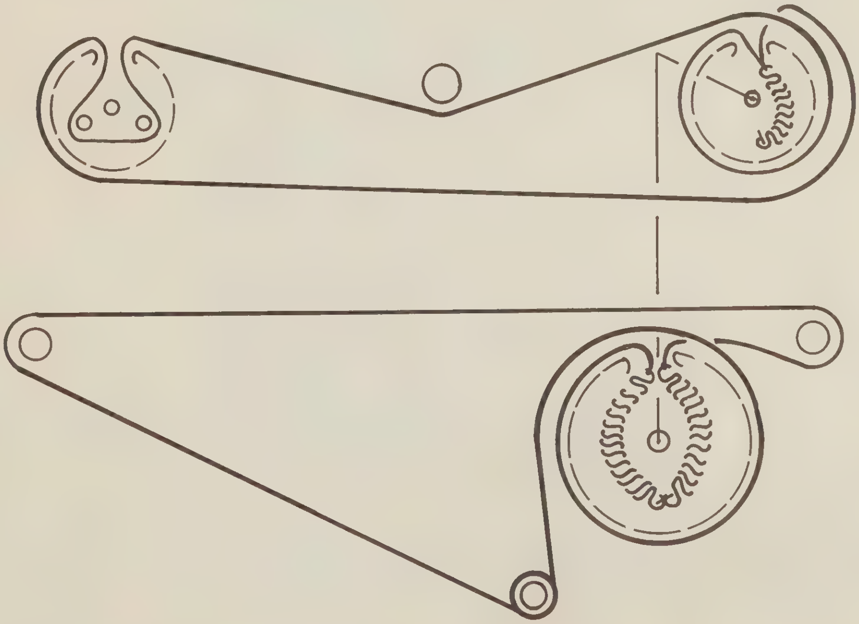
| 100 | 250 | 300 | 500 | 750 | 1000 | 1500 | 2000 | 2500 | 5000 | WATTS POWER | 10000 | 1500 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| H | K | L | M | N | O | P | Q | R | S | CODE | T | U |

| | | | | |
|---|---|---|---|---|
| WJAG Norfolk, Nebr......O | ‡KTHS Hot Springs, Ark..T | 1060 | | |
| KJBS San Francisco, Cal.. M | WCAZ Carthage, Ill. .......H | 1070 | | †WTAM Clev |
| | | 1080 | | WMBI-WCBD |
| | *KMOX St. Louis, Mo... W | 1090 | | |
| CBR Vancouver, B. C......S<br>▲KGDM Stockton, Cal......O | *KWKH Shreveport, La. ...T | 1100 | | |
| | KSOO Sioux Falls, S. D....S | 1110 | | XELO Piedras |
| KFIO Spok'e, Wash, (KRSC) H<br>KFSG-KRKD Los Angeles M | CKX Brandon, Man.......O<br>WTAW College Station, Tex M<br>KTBC Austin, Tex...O | 1120 | | *WISN Milwauk<br>⸸WJBO Baton |
| *KSL Salt Lake City, Utah. W | | 1130 | | WJJD Chicago, |
| | ‡KVOO Tulsa, Okla......V | 1140 | | *WAPI Birmingh |
| | XEH Monterey, Mex.......K | 1150 | | |
| | XED Guadalajara, Mex....M | 1160 | | ⸸WOWO Ft. Wa |
| | | 1170 | | |
| ⸸KEX Portland, Ore.........S<br>‡KOB Albuquerque, N. M...T | ▲WDGY Minneapolis, Minn.. O | 1180 | | *WMAZ Macon, |
| KTKC Viscalia, Cal......K | ‡WOAI San Antonio, Tex. W | 1190 | | WSAZ Hunting |
| KSUN-KGFJ-KVCV▲KVEC<br>‡KWG-KFXD-KDNC▲KOOS<br>▲KVOS‡KELO-KGVL-KFXJ<br>KGCI-KVNU-KAST | KBTM-KGHI-KGEK<br>KFJB-KMLB-WBNO-WJBW<br>KWNO-KGDE-WIL<br>▲KADA-WBBZ-WCAT-WDSM | 1200 | | WJHL<br>WBHP-WJRD-<br>WWAE-WFAM-<br>WCPO-WHBY- |
| KGLU<br>▲KDON-KPPC*KROY▲KFXM<br>‡KPFA-KLAH-KFJI▲KGY<br>KHBG▲KASA-KWTN-KWJB | KFPW-WHBF*KGLO-KIUL<br>KANS*WMFG-WGRM-WGCM<br>KFVS▲KFOR-KDLR▲KVSO<br>KALB-WJMC-KOCA-WIBU | 1210 | | WJBY-WCRW-<br>WEBQ-WTAX-<br>WJW‡WCOL-<br>WSIX-WCOV- |
| KTW Seattle...(KWSC)...O | ⸸WREN-KFKU Kansas City O | 1220 | | *WDAE Tampa, |
| CJOC Lethbridge, Alta.....H<br>KYA San Francisco, Cal....O | ‡KGBX Springfield, Mo....M<br>KGGM Albuquerque, N.M. O | 1230 | | *WFBM Indiana |
| KGCU Manden No. Dakota K<br>‡KTFI Twin Falls, Idaho...M | ▲KTAT Ft. Worth, Tex.....O | 1240 | | ⸸WXYZ Detroit<br>XEKL Leon, M |
| ▲KIT Yakima, Wash.......M<br>KFOX Long Beach, Cal....O | ⸸WTCN Minneapolis, Minn..O<br>KXOK St. Louis, Mo.......O | 1250 | | WEST New Ca<br>⸸WDSU New Or |
| ▲KGVO Missoula, Mont....O<br>KVOA Tucson, Arizona....O<br>KHSL Chico, Cal......K | ⸸▲KOIL Omaha, Nebr......O<br>KPAC Port Arthur (‡KRGV) O | 1260 | | *WHIO Dayton,<br>*WTOC Savann |
| *KOL Seattle, Wash.........O | KWLC-KGCA Decorah, Ia H<br>*KVOR Colo. Springs, Colo..O | 1270 | | ⸸WOOD-WASH<br>†WJDX Jackson |
| *KFBB Great Falls, Mont...O<br>KLS Oakland, Cal.........K | ‡WIBA Madison, Wis......O<br>▲WRR Dallas, Tex.........M | 1280 | | *WDOD Chattan |
| †KDYL Salt Lake City.....O | ‡WEBC Duluth, Minn......O<br>*KTRH Houston, Tex......O | 1290 | | *WJAS Pittsbur |
| KALE Portland, Ore.......O<br>KFAC Los Angeles, Cal....O | WHBL Sheboygan, Wis....M<br>*KFH Wichita, Kas........O | 1300 | | ‡WFBC Greenv |
| *KARM-KCRJ-KSRO KHUB<br>KGEZ-KRQA-KSUB-KPDN<br>▲KXRO-KGFW-KBND | KCKN-KVOL-KRMD-KOME<br>KVOX-KROC-KRBA-KWOS<br>KWOC-KRRV-KOCY-KAND<br>KFPL‡KTSM-WDAH-KFYO | 1310 | | ⸸WSGN-WGAU-<br>WCLS-WTRC-<br>WCMI⸸WFDF-<br>WTJS‡WROL- |
| KID Idaho Falls, Idaho....M<br>*▲KGMB Honolulu.........O | *KRNT Des Moines, Iowa....O<br>‡KGHF Pueblo, Colo........M | 1320 | | *WADC Akron,<br>†WSMB New O |
| ▲KMO Tacoma, Wash......O<br>▲KGB San Diego, Cal.......O | *KSCJ Sioux City, Ia.......O<br>‡KRIS Corpus Christi, Tex..M | 1330 | | *WTAQ Green<br>‡▲WSAI Cincinn |
| ‡KGIR Butte, Mont.........M | KDTH Dubuque, Iowa....M<br>KGNO Dodge City, Kas....K | 1340 | | ⸸WSPD Toledo,<br>*WCOA Pensac |
| ‡KIDO Boise, Idaho.........O | ⸸▲KWK St. Louis, Mo.......O | 1350 | | †WMBG Richm |
| KLPM Minot, N. D.......M<br>KGER Long Beach, Cal....O | ▲KCRC Enid, Okla.........K<br>WQBC Vicksburg, Miss....O | 1360 | | WGES Chicago<br>*WSBT South B |
| *KGAR‡KERN-KRE-KICA<br>KGFL▲KSLM-KOBH<br>KRKO-KEEN-KUJ-KWYO<br>KIUP-KOKO-KGKL-KRMC | KELD-KONO-KTEM-KFGQ<br>*WOC-KVGB-WMIN*WHLB<br>WFOR▲KTOK-KFJZ<br>KLUF-KFRO-KMAC-KVRS | 1370 | | WMFO-WAGF-<br>‡WGL-WGRC-<br>WPAY-WHBQ-<br>WHLS |
| *KOH Reno, Nev..........M | *WKBH La Crosse, Wis.....O | 1380 | | WSMK Dayton<br>‡WALA Mobile |
| KRLC Lewiston, Ida..K<br>*KOY Phoenix, Ariz.........O | *KLRA Little Rock, Ark....O | 1390 | | ⸸▲WHK Clevela |
| ⸸KLO Ogden, U.. (*KHBC) M | *KTUL Tulsa, Okla.........O | 1400 | | †WIRE Indiana |
| ‡KMED Medford, Ore......K<br>‡KGNC Amarillo, Tex.......O | KFJM Grand Forks, N.D..M<br>WROK Rockford, Ill.......M | 1410 | | WSCM Bay Ci<br>*WSFA Montgo |
| KUMA-KSAN-KRBM▲KORE<br>KBPS-KXL-KEUB-KGIW<br>KIDW-KWBG-KRLH-KATE<br>KVAK | KCMC-KLBM-WJBO-WMBH<br>▲KGFF-KABR-KRBC-KNET<br>KIUN-KABC*WACO-KFIZ<br>KDNT-KFAM-KRIC-KTRI | 1420 | | WMSD-WHFC-<br>WPAD⸸WELL-<br>WAPO*WPAR- |
| KINY Juneau, Alaska......K<br>⸸KECA Los Angeles, Cal....O | ⸸▲KSO Des Moines, Ia......K<br>KGNF No. Platte, Neb.....O | 1430 | | *WBNS Columb<br>⸸WMPS Memph |
| ▲KELA Centralia, Wash....M<br>KDFN Casper, Wyo.......M | *WMBD Peoria, Ill.........O<br>⸸KXYZ Houston, Tex.......O | 1440 | | *WBIG Greensb |
| ▲KIEM Eureka, Cal........M<br>KGCX Wolf Point, Mont...O | KCMO Kansas City, Mo...O<br>‡KTBS Shreveport, La......O | 1450 | | *WGAR Clevela<br>⸸WAGA Atlanta |
| | †KSTP St. Paul, Minn......T | 1460 | | |
| ⸸KGA Spokane, Wash......S | | 1470 | | *WLAC Nashvil |
| | *KOMA Okla. City, Okla....S | 1480 | | WHIP Hammo |
| ‡KFBK Sacramento, Cal....T | | 1490 | | ‡WCKY Cincinn |
| KSAM-KBKR-KROD-KYCA<br>▲KPQ▲KXO▲KVOE▲KDB<br>KAWM-KOVC▲KRNR-KUTA<br>KSAL-KWEW-KVWC | KOTN*WKBB-WTMV-KPAB<br>KPLC*KDAL-KGKY▲KBIX<br>*KNOW-KBST-KNEL-KGFI<br>KYSM-KPLT-KGKB-WGIL | 1500 | | WHBB-WKBV-<br>WOMI-WOPI- |
| | | 1510 | | CKCR Waterlo |
| | KITE Kansas City, Mo. ...O | 1530 | | |
| ▲KPMC Bakersfield Cal . O | | 1550 | | |

# BROWNING
# MODEL RJ-20A



| | | | |
|---|---|---|---|
| TRADE NAME | Browning, Model RJ-20A | | |
| MANUFACTURER | Browning Laboratories Inc., Winchester, Mass. | | |
| TYPE SET | AC Operated AM-FM Superheterodyne Tuner | | |
| TUBES (FIFTEEN) | Types 6AU6 FM RF Amp., 7F8 FM Converter, 6J6 AFC Reactance, 6AU6 1st. FM IF Amp., 6AU6 2nd. FM IF Amp., 6AU6 1st. Limiter, 6AU6 2nd. Limiter, 6AL5 Disc., 6SG7 AM RF Amp., 6SA7 Converter, 6SK7 AM IF Amp., 6AL5 AM Det.-AVC, 6SN7GT AF Amp., 6AL7GT Tuning Eye, 563GT Rectifier | | |
| POWER SUPPLY | 110-129 Volts AC | RATING | .68 Amp. @ 117 Volts AC |
| TUNING RANGE—BROADCAST | 550-1600KC | FREQ. MOD. | 88-108 MC |



21/2 TURNS
DIAL CORD DRIVE

**HOWARD W. SAMS & CO., INC. • Indianapolis 1, Indiana**

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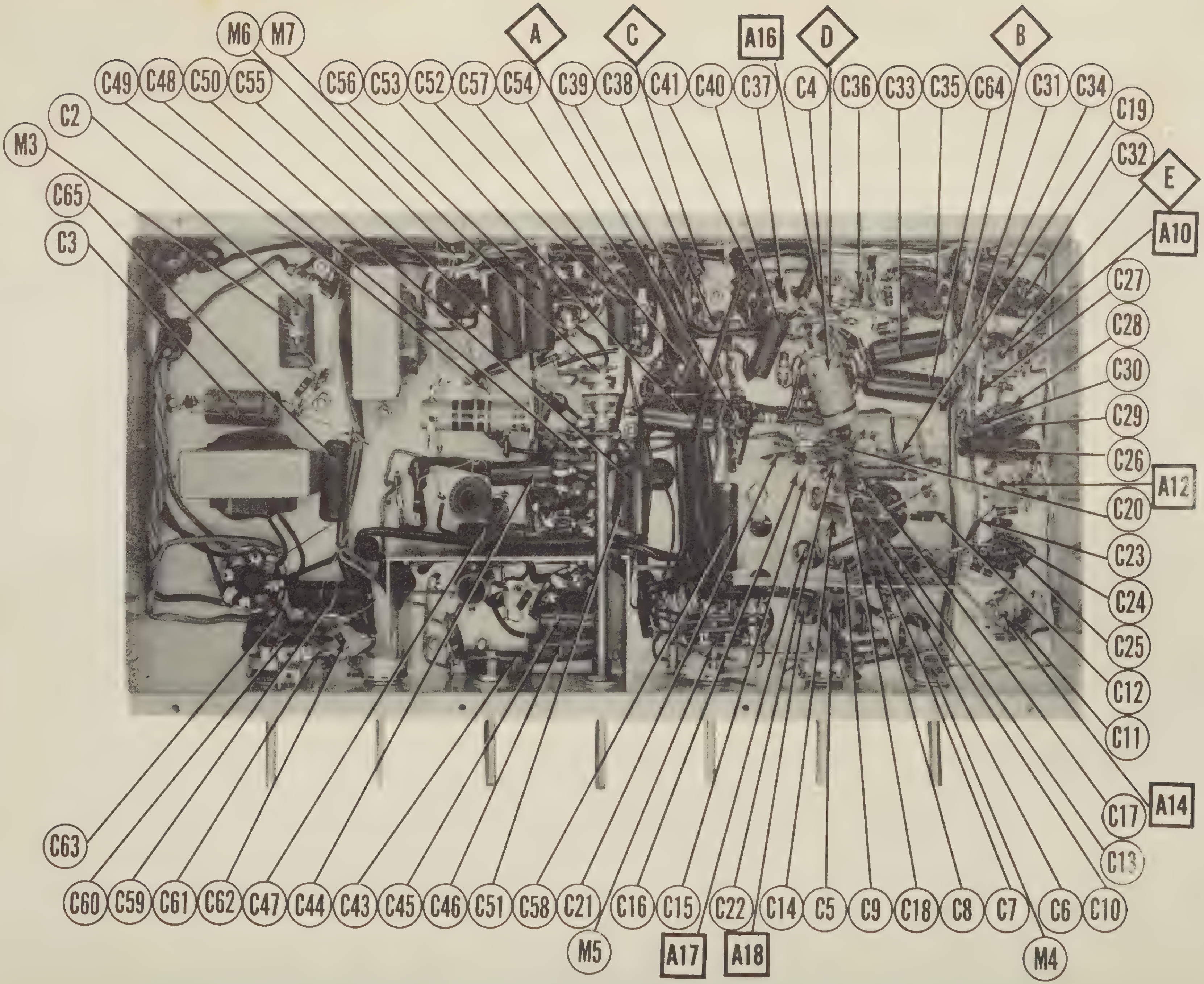
M6
M7
A
C
A16
D
B
C49
C48
C50
C55
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C52
C57
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C39
C38
C41
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C36
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C19
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A10
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C44
C43
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C46
C51
C58
C21
C16
C15
C22
C14
C5
C9
C18
C8
C7
C6
C10
M5
A17
A18
M4

# PARTS LIST AND DESCRIPTIONS

## TUBES (SYLVANIA or Equivalent)

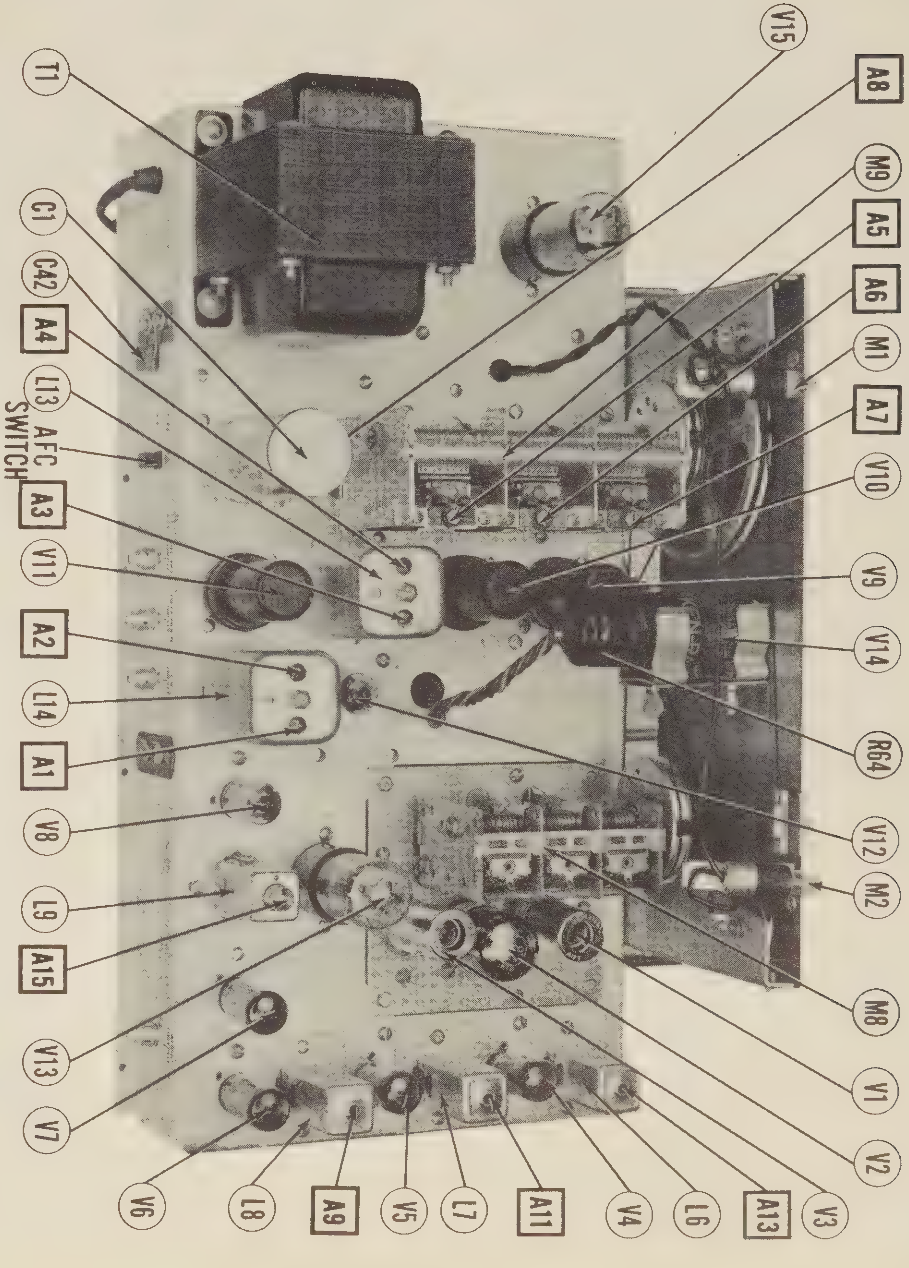
| ITEM No. | USE | REPLACEMENT DATA |  | RMA BASE TYPE | NOTES |
|---|---|---|---|---|---|
|  |  | BROWNING PART No. | STANDARD REPLACEMENT |  |  |
| V1 | FM RF Amplifier | 6AU6 | 6AU6 | 7BK |  |
| V2 | FM Converter | 7F8 | 7F8 | 8BW |  |
| V3 | AFC Reactance | 6J6 | 6J6 | 7BF |  |
| V4 | 1st. FM IF Amp. | 6AU6 | 6AU6 | 7BK |  |
| V5 | 2nd. FM IF Amp. | 6AU6 | 6AU6 | 7BK |  |
| V6 | 1st. Limiter | 6AU6 | 6AU6 | 7BK |  |
| V7 | 2nd. Limiter | 6AU6 | 6AU6 | 7BK |  |
| V8 | Discriminator | 6AL5 | 6AL5 | 6BT |  |
| V9 | AM RF Amplifier | 6SG7 | 6SG7 | 8BK |  |
| V10 | AM Converter | 6SA7 | 6SA7 | 8R |  |
| V11 | AM IF Amplifier | 6SK7 | 6SK7 | 8N |  |
| V12 | AM Detector-AVC | 6AL5 | 6AL5 | 6BT |  |
| V13 | AF Amplifier | 6SN7GT | 6SN7GT | 8BD |  |
| V14 | Tuning Indicator | 6AL7 | 6AL7 | 8CH |  |
| V15 | Rectifier | 5Y3GT | 5Y3GT | 5T |  |

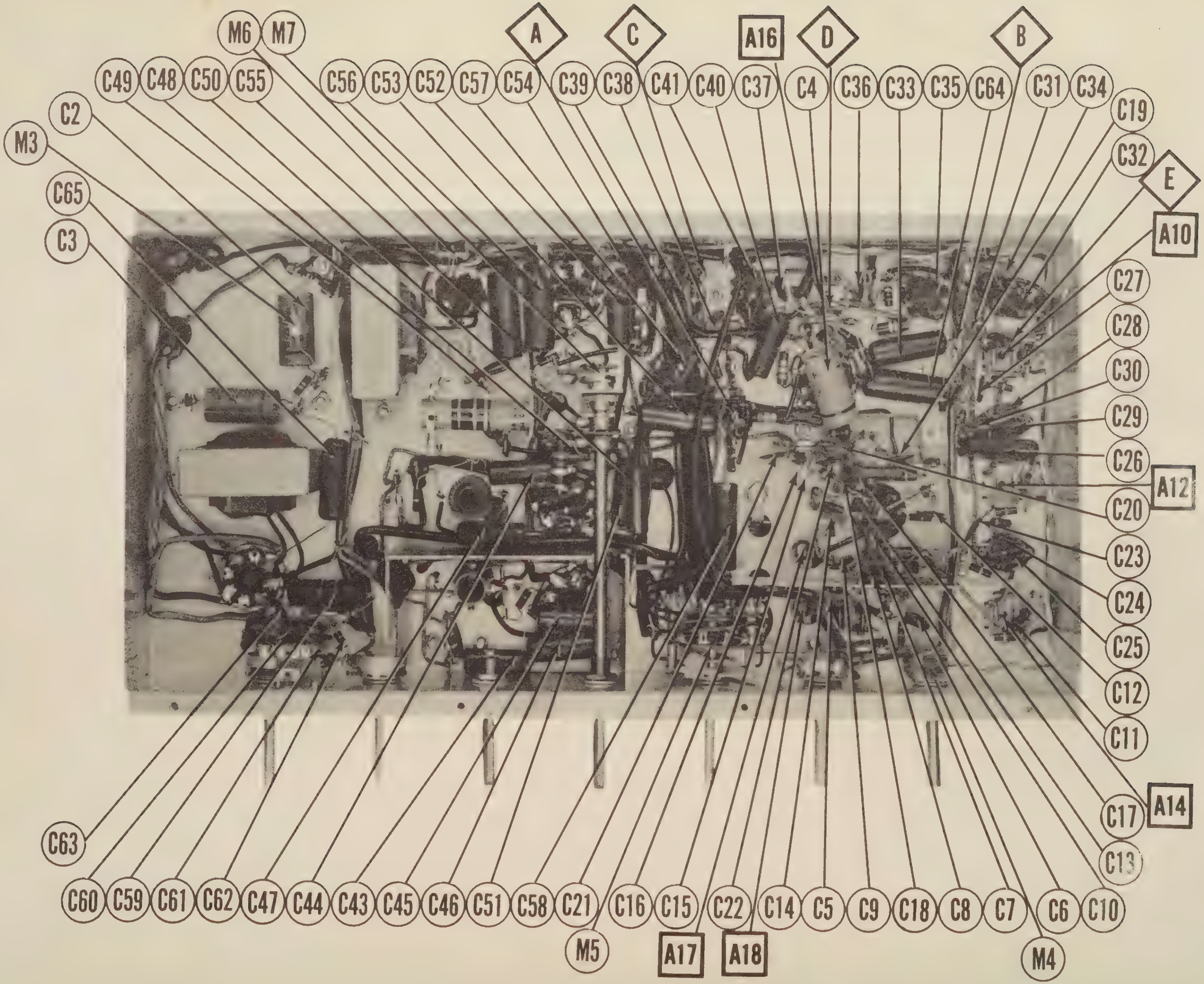
## CAPACITORS

**Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING |  | REPLACEMENT DATA |  |  |  |  |  | IDENTIFICATION CODES AND INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|---|
|  | CAP. | VOLT | BROWNING PART No. | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | ERIE PART No. | SPRAGUE PART No. |  |
| C1A | 40 | 450 |  | AF88F |  | UPT4445 |  | TVL-2764 | ● Filter |
| B | 40 | 450 |  |  |  |  |  |  | ▲ Filter |
| C2 | 10 | 25 |  | PRS25/10 |  | BR102A |  | TVA-1204 | Filter |
| C3 | 10 | 25 |  | PRS25/10 |  | BR102A |  | TVA-1204 | Filter |
| C4 | 20 | 25 |  | PRS25/25 |  | BR252A |  | TVA-1205 | AF Amp. Cathode |
| C5 | 50 | 500 |  | 1468-00005 | D6-500 | 5W5Q5 | GP1K-50 | 1FM-45 | RF Coupling |
| C6 | 5000 |  |  | BPD-005 | DD-502 | 1D5D5 | 811-005 | 29C1 | AVC Filter |
| C7 | 5000 |  |  | BPD-005 | DD-502 | 1D5D5 | 811-005 | 29C1 | FM RF Amp. Dec. |
| C8 | 5000 |  |  | BPD-005 | DD-502 | 1D5D5 | 811-005 | 29C1 | FM RF Amp. Screen |
| C9 | 5000 |  |  | BPD-005 | DD-502 | 1D5D5 | 811-005 | 29C1 | FM RF Amp. Fil. |
| C10 | 100 | 500 |  | 1468-0001 | D6-101 | 5W5T1 | GP1K-100 | 1FM-31 | IF Coupling |
| C11 | 5000 |  |  | BPD-005 | DD-502 | 1D5D5 | 811-005 | 29C1 | FM Conv. Plate Dec. |
| C12 | 5000 |  |  | BPD-005 | DD-502 | 1D5D5 | 811-005 | 29C1 | FM Conv. Cathode * |
| C13 | 5 |  |  | SI5NP0 | TCZ-4.7 | 5R5V5 | NP0K-5 | MS-55 | Osc. Coupling |
| C14 | 33 | 500 |  | SI33 | D6-330 | 5W5Q3 | GP1K-33 | 19C42 | Osc. Grid Cap. |
| C15 | 10 |  |  |  |  |  | N220K-10 |  | Fixed Trimmer |
| C16 | 5 |  |  | SIN750 |  |  | N750K-5 |  | Fixed Trimmer |
| C17 | 5000 |  |  | BPD-005 | DD-502 | 1D5D5 | 811-005 | 29C1 | FM Conv. Plate |
| C18 | 10 | 500 |  | 1468-00001 | D6-100 | 5W5Q1 | GP1K-10 | MS-41 | AFC Coupling |
| C19 | 5000 |  |  | BPD-005 | DD-502 | 1D5D5 | 811-005 | 29C1 | RF Bypass |
| C20 | 100 | 500 |  | 1468-0001 | D6-101 | 5W5T1 | GP1K-100 | 1FM-31 | AFC Filter |
| C21 | 5000 |  |  | BPD-005 | DD-502 | 1D5D5 | 811-005 | 29C1 | AFC Filter |
| C22 | 5000 |  |  | BPD-005 | DD-502 | 1D5D5 | 811-005 | 29C1 | AFC React. Fil. |
| C23 | 5000 |  |  | BPD-005 | DD-502 | 1D5D5 | 811-005 | 29C1 | FM 1st. IF Dec. |
| C24 | 5000 |  |  | BPD-005 | DD-502 | 1D5D5 | 811-005 | 29C1 | FM 1st. IF Screen |
| C25 | 5000 |  |  | BPD-005 | DD-502 | 1D5D5 | 811-005 | 29C1 | FM 1st. IF Cathode |
| C26 | .01 | 600 |  | P688-01 | D6-103 | PTE6S1 | 821-01 | 6TM-S1 | RF Bypass |
| C27 | 5000 |  |  | BPD-005 | DD-502 | 1D5D5 | 811-005 | 29C1 | FM 2nd. IF Dec. |
| C28 | 5000 |  |  | BPD-005 | DD-502 | 1D5D5 | 811-005 | 29C1 | FM 2nd. IF Screen |
| C29 | 5000 |  |  | BPD-005 | DD-502 | 1D5D5 | 811-005 | 29C1 | FM 2nd. IF Cathode |
| C30 | 5000 |  |  | BPD-005 | DD-502 | 1D5D5 | 811-005 | 29C1 | FM 2nd. IF Fil. |
| C31 | 47 | 500 |  | 1468-00005 | D6-470 | 5W5Q5 | GP1K-47 | 1FM-45 | 1st. Limiter Grid |
| C32 | 5000 |  |  | BPD-005 | DD-502 | 1D5D5 | 811-005 | 29C1 | 1st. Limiter Screen |
| C33 | .047 | 600 |  | P688-047 | DF-503 | PTE6S5 |  | 6TM-S47 | AVC Filter |
| C34 | 47 | 500 |  | 1468-00005 | D6-470 | 5W5Q5 | GP1K-47 | 1FM-45 | IF Coupling † |
| C35 | 47 | 500 |  | 1468-00005 | D6-470 | 5W5Q5 | GP1K-47 | 1FM-45 | 2nd. Limiter Screen |
| C36 | 5000 |  |  | BPD-005 | DD-502 | 1D5D5 | 811-005 | 29C1 | 2nd. Limiter Plate Dec. |
| C37 | 5000 |  |  | BPD-005 | DD-502 | 1D5D5 | 811-005 | 29C1 | RF Bypass |
| C38 | 47 | 500 |  | 1468-00005 | D6-470 | 5W5Q5 | GP1K-47 | 1FM-45 | RF Bypass |
| C39 | 1000 | 500 |  | 1468-001 | D6-102 | 1W5D1 | GP2L-001 | 1FM-21 | De-emphasis |
| C40 | .01 | 600 |  | P688-01 | D6-103 | PTE6S1 | 821-01 | 6TM-S1 | AFC Filter |
| C41 | 5000 |  |  | BPD-005 | DD-502 | 1D5D5 | 811-005 | 29C1 | Discr. Fil. Bypass |
| C42 | 250 | 500 |  | 1468-00025 | D6-251 | 5W5T25 | GP2K-250 | 1FM-325 | Ant. Coupling |
| C43 | .01 | 600 |  | P688-01 | D6-103 | PTE6S1 | 821-01 | 6TM-S1 | AVC Filter |
| C44 | .01 | 600 |  | P688-01 | D6-103 | PTE6S1 | 821-01 | 6TM-S1 | AM RF Amp. Plate Dec. |
| C45 | .01 | 600 |  | P688-01 | D6-103 | PTE6S1 | 821-01 | 6TM-S1 | AM RF Amp. Screen |
| C46 | .047 | 600 |  | P688-047 | DF-503 | PTE6S5 |  | 6TM-S47 | AM RF Amp. Cathode |
| C47 | .01 | 600 |  | P688-01 | D6-103 | PTE6S1 | 821-01 | 6TM-S1 | AVC Filter |
| C48 | 47 | 500 |  | 1468-00005 | D6-470 | 5W5Q5 | GP1K-47 | 1FM-45 | Osc. Grid Cap. |

# CHASSIS—TOP VIEW

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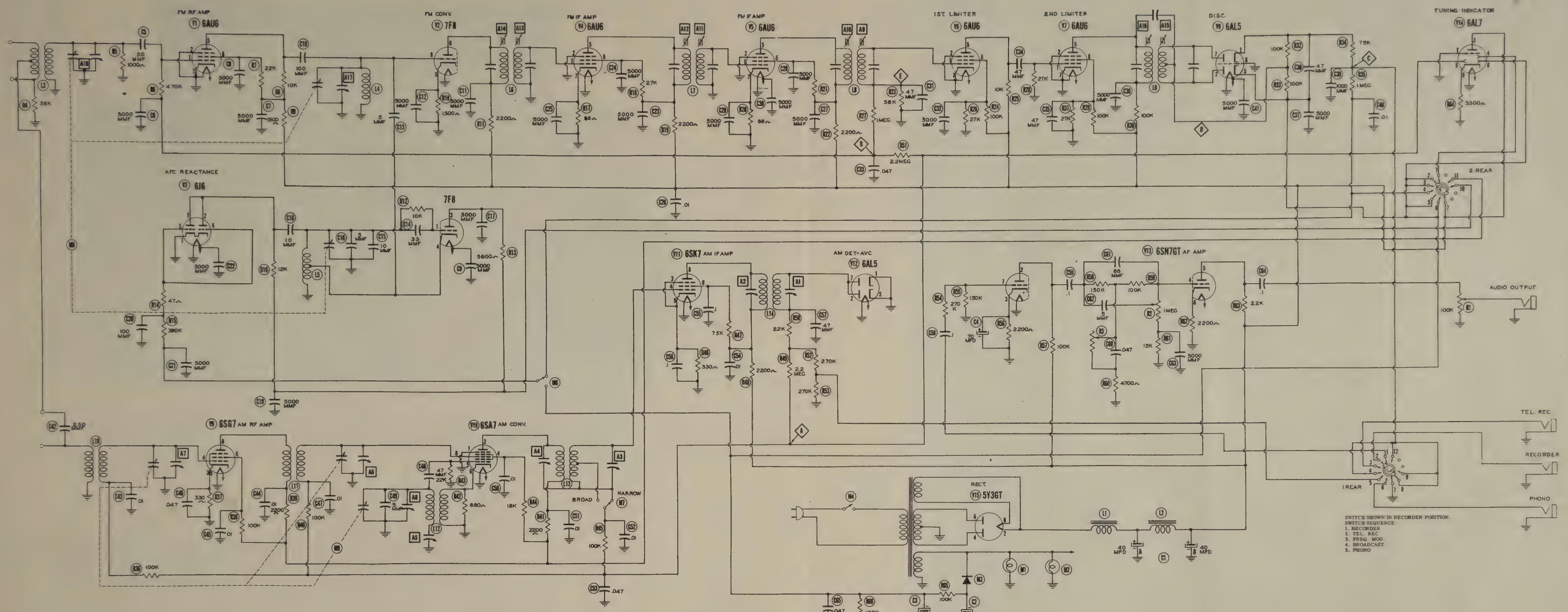

VOLTAGE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 |
|---|---|---|---|---|---|---|---|---|---|
| V 1 | 6AU6 | -.8VDC | 0V | 0V | 6.3VAC | 130VDC | 160VDC | 0V | |
| V 2 | 7F8 | ‡†-3.2VDC | 0V | †200VDC | 0V | †5.3VDC | 245VDC | 6.3VAC | 0V |
| V 3 | 6J6 | †160VDC | †160VDC | 6.3VAC | 0V | ϕ -1.5VDC<br>■-1VDC | ϕ-1.5VDC<br>■-1VDC | 0V | |
| V 4 | 6AU6 | 0V | 0V | 6.3VAC | 0V | 225VDC | 135VDC | .8VDC | |
| V 5 | 6AU6 | 0V | 0V | 6.3VAC | 0V | 225VDC | 135VDC | .8VDC | |
| V 6 | 6AU6 | -.6VDC | 0V | 6.3VAC | 0V | †240VDC | †50VDC | 0V | |
| V 7 | 6AU6 | †-.8VDC | 0V | 6.3VAC | 0V | †55VDC | †45VDC | 0V | |
| V 8 | 6AL5 | -3VDC | -4VDC | 6.3VAC | 0V | -3.6VDC | 0V | -4VDC | |
| V 9 | 6SG7 | ▲1.6VDC | 0V | ▲1.6VDC | ▲-.3VDC | ▲1.6VDC | 145VDC | 6.3VAC | ▲250VDC |
| V 10 | 6SA7 | 0V | 6.3VAC | ▲250VDC | ▲80VDC | ‡▲-1.1VDC | 0V | 0V | ▲-.2VDC |
| V 11 | 6SK7 | 0V | 0V | ▲2.5VDC | ▲-.2VDC | ▲2.5VDC | ▲110VDC | 6.3VAC | 235VDC |
| V 12 | 6AL5 | 0V | -.6VDC | 6.3VAC | 0V | 0V | 0V | -.6VDC | |
| V 13 | 6SN7GT | 0V | 100VDC | 4VDC | 0V | 185VDC | 7.3VDC | 6.3VAC | 0V |
| V 14 | 6AL7GT | 0V | 0V | 250VDC | †-.6VDC<br>■-3.8VDC | †-.6VDC<br>■-2VDC | -3.6VDC | 6.3VAC | .6VDC |
| V 15 | 5Y3GT | 265VDC | 280VDC | 0V | 350VAC | 0V | 350VAC | 0V | 280VDC |

‡ TAKEN WITH VACUUM TUBE VOLTMETER

RESISTANCE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 |
|---|---|---|---|---|---|---|---|---|---|
| V 1 | 6AU6 | 1.5Meg | 0Ω | 0Ω | .1Ω | †12KΩ | †24KΩ | 0Ω | |
| V 2 | 7F8 | 10KΩ | 0Ω | ‡†5.9KΩ | 0Ω | 1.5KΩ | ‡†2.5KΩ | .1Ω | 0Ω |
| V 3 | 6J6 | ‡†12KΩ | ‡†12KΩ | .1Ω | 0Ω | ‡ϕ470KΩ<br>‡■1.8Meg | ‡ϕ470KΩ<br>‡■1.8Meg | 0V | |
| V 4 | 6AU6 | 1.4Ω | 0Ω | .1Ω | 0Ω | †2.5KΩ | †30KΩ | 68Ω | |
| V 5 | 6AU6 | 1.4Ω | 0Ω | .1Ω | 0Ω | †2.5KΩ | †30KΩ | 68Ω | |
| V 6 | 6AU6 | 56KΩ | 0Ω | .1Ω | 0Ω | †10KΩ | †40KΩ | 0Ω | |
| V 7 | 6AU6 | 27KΩ | 0Ω | .1Ω | 0Ω | †100KΩ | †40KΩ | 0Ω | |
| V 8 | 6AL5 | †270KΩ | †180KΩ | .1Ω | 0Ω | †80KΩ | 0Ω | †180KΩ | |
| V 9 | 6SG7 | 330Ω | 0Ω | 330Ω | 1.6Meg | 330Ω | ▲†100KΩ | .1Ω | ▲†2.5KΩ |
| V 10 | 6SA7 | 0Ω | .1Ω | ▲†2.5KΩ | ▲†18KΩ | 22KΩ | 2.5Ω | 0Ω | 1.6Meg |
| V 11 | 6SK7 | 0Ω | 0Ω | 330Ω | 1.6Meg | 330Ω | †78KΩ | .1Ω | †2.5KΩ |
| V 12 | 6AL5 | 0Ω | 560KΩ | .1Ω | 0Ω | 0Ω | 0Ω | 560KΩ | |
| V 13 | 6SN7GT | 150KΩ | †100KΩ | 2.2KΩ | 105KΩ | †22KΩ | 2.2KΩ | .1Ω | 0Ω |
| V 14 | 6AL7GT | 0Ω | 0Ω | †300Ω | †1.3Meg<br>▲80KΩ | 1.5Meg | 80KΩ | .1Ω | 3.3KΩ |
| V 15 | 5Y3GT | †150Ω | 30KΩ | Inf. | 110Ω | Inf. | 110Ω | Inf. | 30KΩ |

† MEASURED FROM PIN 2 OF V15

MEASUREMENTS TAKEN IN AM OR FM POSITION
† TAKEN IN FM POSITION
▲ TAKEN IN AM POSITION
ϕ AFC SWITCH OFF
■ AFC SWITCH ON

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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# PARTS LIST AND DESCRIPTIONS (Continued)

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| C49 | 5 | | | SI5N750 | | | N750K-5 | | Fixed Trimmer |
| C50 | .01 | 600 | | P688-01 | D6-103 | PTE6S1 | 821-01 | 6TM-S1 | Osc. Anode Bypass |
| C51 | .01 | 600 | | P688-01 | D6-103 | PTE6S1 | 821-01 | 6TM-S1 | AM Conv. Dec. |
| C52 | .01 | 600 | | P688-01 | D6-103 | PTE6S1 | 821-01 | 6TM-S1 | AVC Filter |
| C53 | .047 | 600 | | P688-047 | DF-503 | PTE6S5 | | 6TM-S47 | AVC Filter |
| C54 | .01 | 600 | | P688-01 | D6-103 | PTE6S1 | 821-01 | 6TM-S1 | IF Amp. Dec. |
| C55 | .1 | 400 | | P488-1 | DF-104 | PTE4P1 | | 4TM-P1 | IF Amp. Screen |
| C56 | .1 | 400 | | P488-1 | DF-104 | PTE4P1 | | 4TM-P1 | IF Amp. Cathode |
| C57 | 47 | 500 | | 1468-00005 | D6-470 | 5W5Q5 | GP1K-47 | 1FM-45 | Diode RF Filter |
| C58 | .1 | 400 | | P488-1 | DF-104 | PTE4P1 | | 4TM-P1 | Audio Coupling |
| C59 | .1 | 400 | | P488-1 | DF-104 | PTE4P1 | | 4TM-P1 | Audio Coupling |
| C60 | .047 | 600 | | P688-047 | DF-503 | PTE6S5 | | 6TM-S47 | Tone Comp. |
| C61 | 68 | 500 | | SI68 | D6-680 | 5W5Q7 | GP1K-48 | MS-47 | Tone Comp. |
| C62 | 5 | | | SI5 | TCZ-4.7 | 5W5V5 | GP1K-5 | MS-55 | Tone Comp. |
| C63 | 5000 | | | BPD-005 | DD-502 | 1D5D5 | 811-005 | 29C1 | RF Bypass ‡ |
| C64 | .1 | 400 | | P488-1 | DF-104 | PTE4P1 | | 4TM-P1 | Audio Coupling |
| C65 | .047 | 600 | | P688-047 | DF-503 | PTE6S5 | | 6TM-S47 | RF Bypass |

* Some models use 1000MMF in this application
† Some models use 22MMF in this application
‡ Not used in all models

## CONTROLS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|
| | RESIST-ANCE | WATTS | Browning PART No. | IRC PART No. | CLAROSTAT PART No. | CENTRALAB PART No. | |
| R1A | 100KΩ | ½ | | Q13-128 | AG-51-Z | B-41 | Volume Control |
| B | Shaft | | | Not Req | RS-2 | Not Req | Attach to R1A per instructions |
| R2A | 1Meg | ½ | | Q13-137 | AG-63-Z | B-70 | Treble Control |
| B | Shaft | | | Not Req | RS-2 | Not Req | Attach to R2A per instructions |
| R3A | 100KΩ | ½ | | Q13-128 | AG-51-Z | B-41 | Bass Control |
| B | Shaft | | | Not Req | RS-2 | Not Req | Attach to R3A per instructions |

## RESISTORS

| ITEM No. | RATING | | REPLACEMENT DATA | | IDENTIFICATION CODES |
|---|---|---|---|---|---|
| | RESISTANCE | WATTS | BROWNING PART No. | IRC PART No. | |
| R4 | 56KΩ | ½ | | BTS-56K | FM Antenna Isolation |
| R5 | 1000Ω | ½ | | BTS-1000 | FM Antenna Coil Shunt |
| R6 | 470KΩ | ½ | | | FM RF Amp. Grid |
| R7 | 22KΩ | 1 | | | FM RF Amp. Screen |
| R8 | 10KΩ | 1 | | | FM RF Amp. Plate |
| R9 | 1500Ω | ½ | | BTS-1500 | FM RF Amp. Decoupling |
| R10 | 1500Ω | ½ | | BTS-1500 | FM Mixer Cathode |
| R11 | 2200Ω | ½ | | BTS-2200 | FM Mixer Decoupling |
| R12 | 10KΩ | ½ | | | FM Osc. Grid |
| R13 | 5600Ω | 1 | | | FM Osc. Plate |
| R14 | 47Ω | ½ | | | Parasitic Suppressor |
| R15 | 390KΩ | ½ | | BTS-390K | AFC Reactance Grid |
| R16 | 12KΩ | 1 | | BTA-12K | AFC Reactance Plate |
| R17 | 68Ω | ½ | | | 1st. FM IF Amp. Cathode |
| R18 | 27KΩ | ½ | | | 1st. FM IF Amp. Screen |
| R19 | 2200Ω | ½ | | BTS-2200 | 1st. FM IF Amp. Decoupling |
| R20 | 68Ω | ½ | | | 2nd. FM IF Amp. Cathode |
| R21 | 27KΩ | ½ | | | 2nd. FM IF Amp. Screen |
| R22 | 2200Ω | ½ | | BTS-2200 | 2nd. FM IF Amp. Decoupling |
| R23 | 56KΩ | ½ | | BTS-56K | 1st. Limiter Grid |
| R24 | 100KΩ | 1 | | BTA-100K | 1st. Limiter Screen |
| R25 | 10KΩ | ½ | | BTS-10K | 1st. Limiter Plate |
| R26 | 27KΩ | ½ | | BTS-27K | Voltage Divider |
| R27 | 1Meg. | ½ | | BTS-1Meg | AVC Network |
| R28 | 27KΩ | ½ | | BTS-27K | 2nd. Limiter Grid |
| R29 | 100KΩ | 1 | | BTA-100K | 2nd Limiter Screen |
| R30 | 100KΩ | ½ | | BTS-100K | 2nd. Limiter Plate |
| R31 | 27KΩ | ½ | | BTS-27K | Voltage Divider |
| R32 | 100KΩ | ½ | | BTS-100K | Disc. Diode Load |
| R33 | 100KΩ | ½ | | BTS-100K | Disc Diode Load |
| R34 | 75KΩ | ½ | | | De-emphasis |
| R35 | 1Meg | ½ | | BTS-1Meg | AFC Network |
| R36 | 100KΩ | ½ | | BTS-100K | AVC Network |
| R37 | 330Ω | ½ | | BTS-330 | AM RF Amp. Cathode |
| R38 | 100KΩ | ½ | | | AM RF Amp. Screen |
| R39 | 2200Ω | ½ | | BTS-2200 | AM RF Amp. Plate Decoupling |
| R40 | 100KΩ | ½ | | BTS-100K | AVC Network |
| R41 | 2200Ω | ½ | | BTS-2200 | AM Mixer Plate Decoupling |
| R42 | 680Ω | ½ | | BTS-680 | AM Osc. Coil Shunt |
| R43 | 22KΩ | ½ | | | AM Osc. Grid |
| R44 | 18KΩ | 2 | | | AM Osc. Anode |
| R45 | 100KΩ | ½ | | BTS-100K | AVC Network |

# PARTS LIST AND DESCRIPTIONS (Continued)

| | | | | | |
|---|---|---|---|---|---|
| R46 | 330Ω | ½ | | BTS-330 | AM IF Amp. Cathode |
| R47 | 75KΩ | 1 | | | AM IF Amp. Screen - See Note |
| R48 | 2200 Ω | ½ | | BTS-2200 | AM IF Amp. Decoupling |
| R49 | 2.2Meg | ½ | | BTS-2.2Meg | AVC Network |
| R50 | 22KΩ | ½ | | BTS-22K | Diode Filter |
| R51 | 2.2Meg | ½ | | BTS-2.2Meg | AVC Network |
| R52 | 270KΩ | ½ | | BTS-270K | AM Det Diode Load |
| R53 | 270KΩ | ½ | | BTS-270K | AM Det Diode Load |
| R54 | 270KΩ | ½ | | BTS-270K | Tone Compensation |
| R55 | 150KΩ | ½ | | BTS-150K | AF Amp. Grid |
| R56 | 2200Ω | ½ | | BTS-2200 | AF Amp. Cathode |
| R57 | 100KΩ | ½ | | BTS-100K | AF Amp. Plate |
| R58 | 150KΩ | ½ | | BTS-150K | Tone Compensation |
| R59 | 100KΩ | ½ | | BTS-100K | Tone Compensation |
| R60 | 4700Ω | ½ | | BTS-4700 | Tone Compensation |
| R61 | 15KΩ | ½ | | BTS-15K | AF Amp. Grid |
| R62 | 2200Ω | ½ | | BTS-2200 | AF Amp. Cathode |
| R63 | 22KΩ | ½ | | BTS-22K | AF Amp. Plate |
| R64 | 3300Ω | ½ | | BTS-3300 | Tuning Indicator Cathode |
| R65 | 100KΩ | ½ | | BTS-100K | Filter |
| R66 | 100KΩ | ½ | | BTS-100K | Voltage Divider |

Note: Some models use 82KΩ Resistor in this application

## TRANSFORMER (POWER)

| ITEM No. | RATING | | | | REPLACEMENT DATA | | | |
|---|---|---|---|---|---|---|---|---|
| | PRI. | SEC. 1 | SEC. 2 | SEC. 3 | BROWNING PART No. | STANCOR PART No. | MERIT PART No. | CHICAGO PART No. |
| T1 | 117VAC @ .68A | 740VCT .078ADC | 5VDC @ 2A | 6.3VAC @ 4.8A | | PC-8410 ① | | PV-100 ① |

① Drill new mounting hole

## FILTER CHOKE

| ITEM No. | RATINGS | | | REPLACEMENT DATA | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| | TOTAL DIRECT CURRENT | D. C. RESISTANCE | INDUCTANCE (0 CURRENT 1000 ∽) | BROWNING PART No. | STANCOR PART No. | MERIT PART No. | CHICAGO PART No. | |
| L1 | .078A<br>.078A | 150Ω<br>150Ω | 5 Henries<br>5 Henries | | C-2303<br>C-2303 | | R-885 ①<br>R-885 ① | |

① Drill new mounting holes

## R F COILS

| ITEM No. | USE | DC RES. | | REPLACEMENT DATA | |
|---|---|---|---|---|---|
| | | PRI. | SEC. | BROWNING PART No. | MEISSNER PART No. |
| L3 | FM Ant. Trans | 0Ω | 0Ω | | |
| L4 | FM RF Coil | 0Ω | | | |
| L5 | FM Osc. Coil | 0Ω | | | |
| L6 | 1st. FM IF | 1.4Ω | 1.4Ω | | |
| L7 | 2nd. FM IF | 1.4Ω | 1.4Ω | | |
| L8 | 3rd FM IF | 1.4Ω | 1.4Ω | | |
| L9 | Disc. Trans. | 1.4Ω | 1.6Ω | | |
| L10 | AM Ant. Trans | 5.5Ω | 4Ω | | |
| L11 | AM RF Coil | 95Ω | 3.7Ω | | |
| L12 | AM Osc. Coil | 2.5Ω | 10Ω | | |
| L13 | 1st. AM IF | 15Ω | 15Ω | | |
| L14 | 2nd AM IF | 16Ω | 16Ω | | |

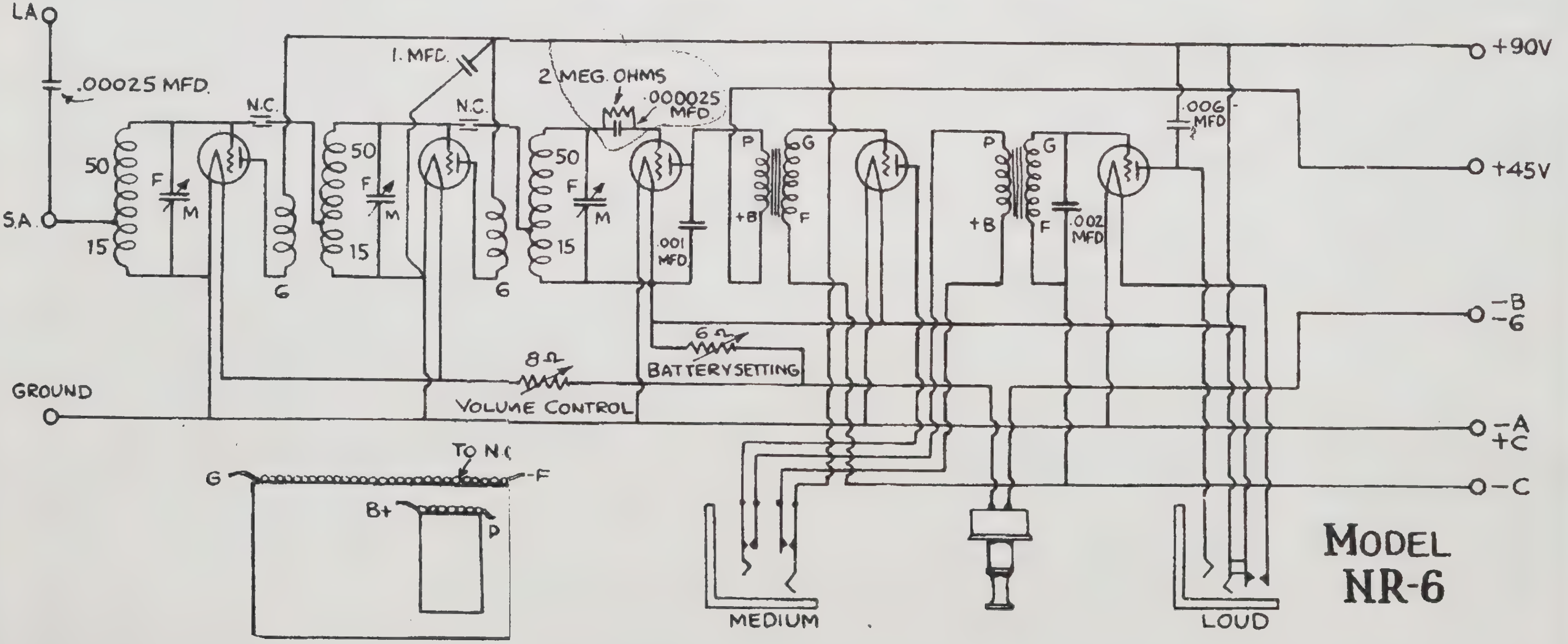
## DIAL LIGHTS

| ITEM No. | BASE TYPE | VOLTS | AMPS. | BEAD COLOR | REPLACEMENT DATA | | NOTES |
|---|---|---|---|---|---|---|---|
| | | | | | BROWNING PART No. | | |
| M1 | Bayonet | 6-8 | .15 | Brown | | | Type #47 |
| M2 | Bayonet | 6-8 | .15 | Brown | | | Type #47 |

## MISCELLANEOUS

| ITEM No. | PART NAME | BROWNING PART No. | NOTES |
|---|---|---|---|
| M3 | Crystal | | 1N-34 |
| M4 | Switch | | Off-On |
| M5 | Switch | | Function |
| M6 | Switch | | AFC |
| M7 | Swtich | | Broad-Narrow, AM Band Width |
| M8 | FM Tuning Gang | | |
| M9 | AM Tuning Gang | | 31-407MMF, 31-407MMF, 31-407MMF |

# FREED-EISEMANN RADIO CORP.



# RESTORATION TOPICS

## Resistance Line Cord and Ballast Tube Replacement

COMPILED FROM CONTRIBUTIONS BY CHARLES W. RHODES AND DON BOROWSKI

*Finding replacements for old resistance line cords and ballast tubes can be a problem. A.R.C. has addressed various solutions in the past, most recently in an article by Ted Rogers in the December 2002 issue. Ted proposed replacing the resistance line cord or ballast tube with a diode. Prompted by Ted's solution, both Charles Rhodes and Don Borowski wrote in proposing another solution: use a capacitor. Here, we combine their two contributions. (Editor)*

In some radios, mostly the transformerless radios introduced in the early 1930s, the tube heaters were connected in series to avoid the need for a transformer to furnish the usually 6.3 volt heater voltage. However, the sum of the heater voltage requirements for all of the tubes often did not add up to the line voltage of 110 volts. Therefore a series resistance in the form of a resistance line cord, a ballast tube or an ordinary resistor was added in series with the tube heater string so that the line voltage was dropped to the correct value for the tube string. Unfortunately, in all three cases, heat was generated, sometimes in amounts that caused concern.

To increase the total voltage of the series heater string and, consequently, reduce the heat generated in the series resistance, special tubes were developed with 25-volt heaters such as the 25Z5 rectifier and the 43 power output tube. These tubes were designed with 0.3 ampere heaters so they could be used in series with the popular 6.3-volt tubes using 0.3 ampere heaters. A typical tube complement would be 25Z5 rectifier, 43 audio power amplifier, 75 2nd detector/AVC rectifier/1st Audio, 78 or 6D6 IF amplifier, and 6A7 1st detector. Adding up the heater voltages the series string required 68.9 volts at 0.3 amperes.

### RESISTANCE LINE CORDS

The earliest transformerless sets employed a resistance line cord in which a nichrome wire was embedded in asbestos insulation to drop the 110-volt line voltage to 68.9 volts for the heater string. The line cord actually heated up. These resistance line cords are a major problem in keeping such receivers operating. The fine nichrome wire is usually broken, or the insulation has failed, exposing the bare nichrome wire.

### BALLAST TUBES

Some transformerless radios used a ballast tube instead of a resistance line cord. This meant that all of the heat produced by the radio was within the cabinet. This was the major disadvantage of ballast tubes, but such radios could be claimed to have six tubes instead of the five which served in sets with resistance line cords. Ballast tubes are actually power resistors in a metal can or metal tube envelope. Eventually, they fail.

### HEAT GENERATED

To drop 110 volts to 68.9 volts in a 0.3 ampere series circuit, the ballast or resistance line cord must dissipate 12.3 watts; that is a significant percentage of the total heat developed by the 5-tube radio. You could use a 140-ohm, 20-watt power resistor to do the job, but where would you put such a hot component? If you mount it inside the radio cabinet, it will overheat all the components and may melt the plastic cabinet. If you put the power resistor outside the radio, how are you going to mount it and insulate the terminals? There is a better way.

### USE A CAPACITOR AND A DIODE

A capacitor can be used instead of a resistance to accomplish the same voltage dropping function when powering the radio from an AC power line, generating almost no heat in the process. (Note, however, that this solution will not work if the radio is to be used with a DC power line, available in some locations when these radios were made, but which is not commonly available today.)

Also, the rectifier tube, usually a 25Z5 or 25Z6GT, can be dispensed with. Sooner or later it will fail, so why not replace it with a modern silicon diode. A silicon diode, such as the 1N4005, will do the job nicely. In most radios, the 25Z5 or 25Z6GT is wired for halfwave rectification, and the diode can be wired directly between cathode and plate terminals of the rectifier tube socket. (See Charles Rhodes' sketch in Figure 1.) In a small number of sets, a "voltage doubler" circuit will be found; for those radios, two diodes are needed.

With the elimination of the vacuum tube rectifier, we only need a total of 43.9 volts for the heater string: 25 volts for the audio output tube plus 3 x 6.3 volts for the other tubes and the string current is still 0.3 amperes. The value of the series capacitor can be determined from the equation:

$$C = \frac{1000 \times I_H}{0.377 \times \div\sqrt{V_L^2 - V_H^2}}$$

Where:

C = Series capacitance value in microfarads
$I_H$ = Series heater current in amperes
$V_L$ = AC line voltage in volts
$V_H$ = heater string voltage sum in volts
Note: 0.377 is 2 x π x 60 Hertz

*[Editor's note: Please take our word for this equation. Its explanation and derivation is two pages long.]*

For the example here:

$I_H = 0.3$ amperes, $V_L = 120$ volts, $V_H = 43.9$ volts

Thus: C = 7.14 microfarad

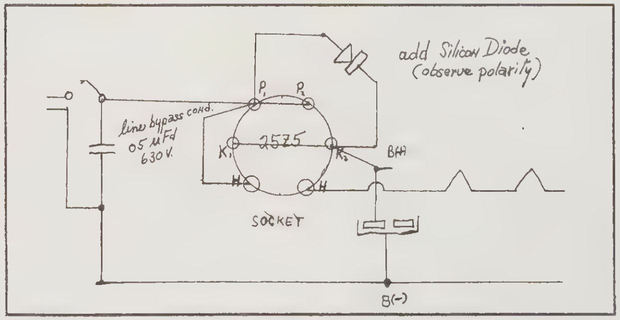


Figure 1. Wiring sketch of a typical halfwave rectification circuit where the added diode is connected between cathode and plate terminals of the rectifier tube socket. Since the diode replaces the function of the rectifier, the rectifier tube must be removed.

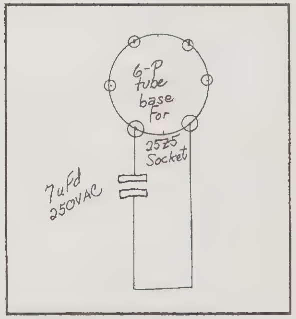


Figure 2. Wiring sketch for the added 7 microfarad capacitor on the 6-pin tube base.

### PILOT LAMPS

What about radios with more than three 6.3-volt tubes in the heater string, and what about pilot lamps? When calculating the value of the capacitor, make sure to add in the pilot lamp voltage(s).

Note that pilot lamps rated for 6- to 8-volt service draw either 0.15 (brown bead) or 0.25 (blue bead) amperes. Each pilot lamp must be shunted with a resistor to bypass the extra current. For 0.15 ampere lamps, you must bypass 0.15 amperes, and for a lamp voltage of 6 volts, the shunt resistor value should be 39 ohms. This resistor will dissipate 0.9 watts. For a 0.25 ampere lamp, 0.05 amperes should pass through the resistor yielding a value of 120 ohms. This resistor will dissipate 0.3 watts.

### PLACEMENT OF THE 7 MF CAPACITOR

But where to put the 7 mF capacitor? Since the rectifier tube has been replaced with a diode mounted under the chassis, we have an obvious placement. Take a defective 6-pin tube, salvage its base, mount a 7 mF paper capacitor in the base, and connect it between pins 1 and 6. Then plug the tube base/capacitor combination into the rectifier tube socket, thus completing the heater circuit.

### ADDITIONAL DETAILS

Choose a capacitor that can withstand the full power line voltage, and it is a good practice to place a bleeder resistor across the capacitor to discharge it after the radio is turned off. A 50 K ohms, ¼-watt resistor works well.

With this modification, the resistance type line cord is replaced with an ordinary line cord. Receivers with a ballast tube instead of a resistance line cord are treated nearly the same way. Remove the ballast tube and connect the resistance terminals together. Generally, when you have a ballast tube, you have one or two pilot lamps. Those should be disconnected from the socket of the ballast tube and shunted as described above, and then series-wired into the heater string.

You will find that the pilot lamps do not flash at turn on, and you may note that the tubes take a little longer to warm up. This is normal and good. The series capacitor limits the peak series current when the radio is turned on. At turn on, the resistance of the tube heaters and pilot lamps are quite low, so without this modification, there is a very large surge current, and that is what burns out the pilot lamps. Now, the initial current is much less, and the tubes will not undergo this current surge.

Use of a polarized plug is highly recommended and the wider blade must be wired to the "cold" side of the chassis or the B-bus, if the set has such. You should check that the chassis is not "hot" relative to a water pipe ground. This can be done with an AC voltmeter.

Remember, use a paper capacitor, not an electrolytic. An electrolytic condenser in this application may explode when you turn the radio on.

Why didn't the manufacturer employ a 7 mF capacitor instead of the resistance line cord or ballast tube? Good question, but back in the early 1930s, a suitable capacitor was much too large physically, and it would certainly have cost more, a real no-no during those bleak Depression years.

A search on the Web produced a possible source of a suitable capacitor: a motor-starting capacitor. Amrad Engineering of Palm Coast, FL, offers a 7.5 mF/370 VAC unit, part number R2000/37-755. Their telephone number is 1-386-445-6000.

Charles Rhodes thanks Bob Casey, WA2ISE, who suggested the use of the capacitor in this application.

*(Charles W. Rhodes, 10105 Howell Dr., Upper Marlboro, MD 20774)*

*As a Cub Scout before World War II, Charles Rhodes built several 1- and 2-tube radios. During the war, he did radio repair, and in college experimented with FM radio and TV repair. Since 1986, he has amassed over 200 radios, mostly battery sets of the 1920s and farm sets of the 1930s. He was instrumental in setting up the Radio Museum in Bowie, Maryland, in 1998, and in restoring the 1906 farmhouse that houses it.*

*(Don Borowski, WA6OMI, 4215 S. University Rd., Spokane, WA, 99206)*

*Don Borowski, an electrical engineer, has been interested in tube electronics since entering first grade in 1957. He began collecting radios and audio equipment in high school and has seen some of his "junk" turn to gold. His collection spans the 1920s to the 1960s. Besides radios, Don collects "interesting electronics" such as videodisk players, linear tracking turntables, and vintage electronic instruments.*

ticular budget and location. Your first days on HF are the most important and lead to your initial impression of the bands. This is when you need the most positive results, and a good antenna delivers the goods, so to speak. Please, please avoid unnecessarily cutting corners by using a random length of stray wire or your dwelling's metal rain gutter as an antenna.

If space is at a premium and you are limited to installing only one wire antenna, consider a high-performance version of the Carolina Windom available from The Radio Works (Box 6159, Portsmouth, VA 23703; telephone 1-800-280-8327, or <www.radioworks.com>). The original Carolina Windom was terrific, and like many users, I found it significantly outperformed a multiband doublet or G5RV. The Radio Works' new optimized versions with custom-wound impedance-matching transformers and line isolators, however, work even better. If visibility is a consideration, get the "LP" (low profile) version. Once installed, you can look straight at it and not realize it's there. My first contact a few years ago when using a Carolina Windom and only 50 watts was a BY in China. My first contact with a new "LP" Carolina Windom this year was a DU in the Philippines, followed by a ZA in Albania, and still while running only 50 watts. You could not ask for a better recommendation than that, Just don't waste time trying to homebrew a copy with baluns; get the "real thing" from The Radio Works. Check out the company's special deal on low-loss RG8X coax, too; Radio Works will even install PL-259 connectors on it for you.

## Operating Hints

If I were to offer just a single suggestion to newer amateurs, it would be to continuously strive to perfect your operating skills and on-the-air image. How? Remember other amateurs only hear your voice, and first impressions are always the longest lasting. Do not feel shy or intimidated simply because the whole world can hear you (what a blast!). Just maintain an air of courtesy and enjoy the ride. If your transceiver has transmit audio equalization, use it (and a custom mic, if funds permit) to enhance your voice. Add only enough speech compression to produce a slight treble boost and add presence.

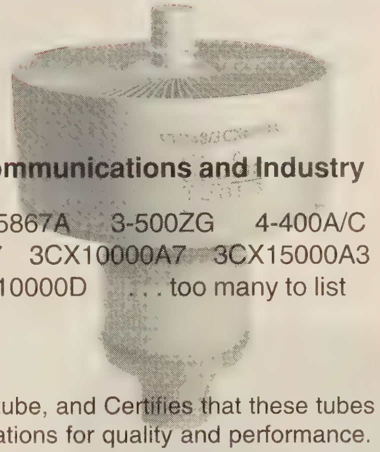
Develop the ability to concentrate on a single signal amidst a crowd of screaming eagles in a contest or pile-up (listening to your significant other while the TV screams with car commercials is good practice here). Notice how sharp operators are in and out of a pile-up while others continue calling in vain, and how some DX stations are overrun by continuous callers when they cannot control a pile-up.

Practice and operate CW, too. It is the ideal way to contact "rare" countries. Just recently, for example, I contacted JT1CQ while running only 50 watts on 20 meters. JT1CQ, incidentally, is in Mongolia and Zone 23, the last zone everyone needs for WAZ. After my QSO, he called CQ—with no U.S. callers. A word to the wise should suffice.

Finally, realize even the best operators with the best gear are not *always* successful and enjoy every HF operating experience regardless of its returns. Just getting on HF is a special treat!

## Conclusion

Once again we have reached the closing wire and must sign off the printed page. Now it is your turn to talk. If you find this "getting started" series useful and would like to see more, let us know. Just send a short note or e-mail to the addresses listed at the beginning of the column. 73, Dave, K4TWJ



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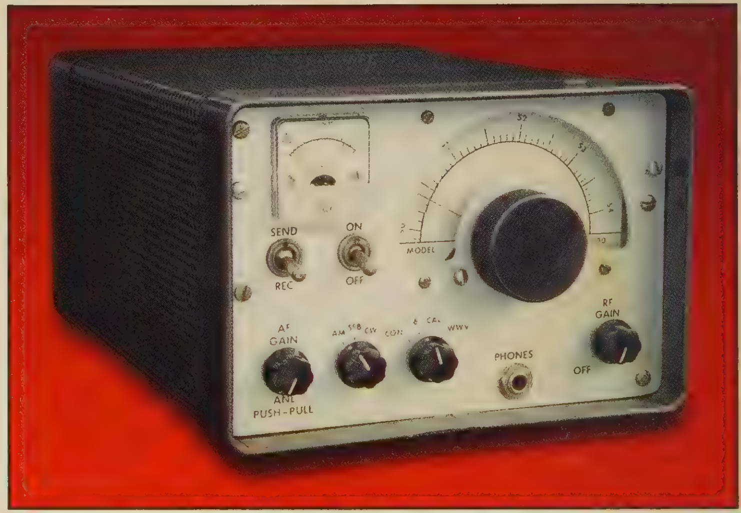
BY JOE VERAS,* K9OCO

# Ed Ladd and the Li'l Lulus



*Whippany Laboratories made only a few prototype Li'l Lulu receivers before canceling plans for a production model. (Photos © Joe Veras, 2004, all rights reserved)*

Ed Ladd was synonymous with 6 meters. His call, W2IDZ, was one of the first heard on the band when the 50–54-MHz allocation replaced the old 5-meter band (56–60 MHz) on March 1, 1946. He rode the crest of record-high sunspot numbers in the 1950s, encouraging others to enjoy the "Magic Band." Ladd is credited with the first confirmed two-way 6-meter QSO, was the first to earn the Worked All States award from the 2nd call area, and carried homebrew equipment along on 6-meter DXpeditions to places lacking 50-MHz activity. Some old-timers still recall his aurora-fluttery W2IDZ/VE8 signals from Canada's Northwest Territories. Today vintage-radio collectors, and even many VHF enthusiasts, remember him best for the equipment he designed and his company, Whippany Laboratories, built in the 1960s. This month's column takes a look at the Li'l Lulu 6-meter transmitter and receiver, as well as the man behind them.

## The 1930s

The Li'l Lulus story runs longer than their brief appearance on the commercial stage. Ed Ladd's own ham history is a lengthy one as well, and not limited to the Whippany Labs equipment. It began in the days when the 5-meter band, even 10 meters, was referred to as UHF.

In the 1930s radio amateurs, as well as others studying the subject, tip-toed all around what we know and take for granted today about radio waves and propagation. It is difficult to construct a frame of reference that enables us to properly appreciate the accomplishments of that earlier age. Extensive tests were done at one time seeking to link the change in radio conditions with the rise and fall of relative humidity.[1] Others sought to plot improved signal paths against the track of thunderstorms. Just when it looked as if someone had discovered conclusive proof in one direction, an equally plausible answer to the same question arose in another. Of course, the 5- and 6-meter region being what it was, radio waves propagated via a number of methods. The spectrum was great for providing good, reliable local communication, but at times it supported long-distance contacts, too. These happened with sunspot-supported *F*-layer propagation, transequatorial propagation, sporadic-*E*, tropo-ducting, aurora, meteor scatter, or even courtesy of the ionization provided by a comet's tail.

Steadily improving equipment helped amateurs populating the *Ultra-Highs* reach out farther and more reliably as the 1930s progressed. Improvements in equipment, while beneficial, were not all voluntary. On December 1, 1938, the Federal Communications Commission issued an order requiring 5-meter transmitters to meet the same strict standards as those below 30 MHz. Modulated oscillators were banished to a new $2^{1}/_{2}$-meter allocation at 112 MHz, created by the same order. Not all regulation need be confining. Cleaner, more stable signals from the new transmitters permitted the use of receivers having greater selectivity. In order to hear even more, 5-meter ops constructed better antennas.[2] The two coasts were not yet communicating on 5 meters, but great work was being done by amateurs in both locations and everywhere in between.[3] The band was an experimenter's paradise. The better equipment being developed allowed hams to experience, for the first time, a number of propagation phenomena. Ed Ladd was one of those at the center of this intense and exciting activity on 5 meters as the 1930s ended and the new decade began. World War II closed the band, and it reopened for business as 6 meters at war's end.

## Post WW II and Beyond

Amateur radio wasn't the sole occupant of its new post-war spectrum. Commercial broadcasting had come up with something called *television,* TV

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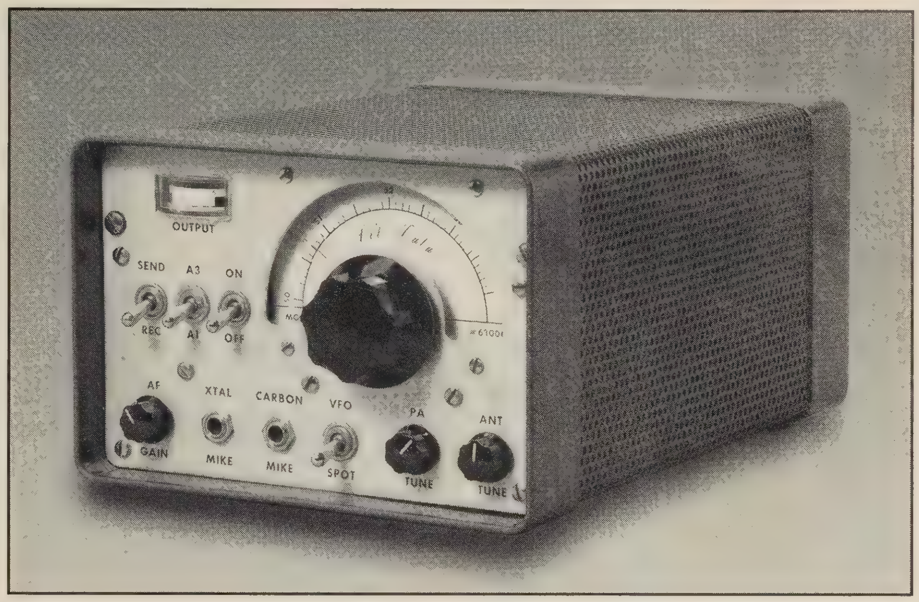
*P.O. Box 1041, Birmingham, AL 35201
e-mail: <k9oco@cq-amateur-radio.com>



*The Li'l Lulu had been a popular 6-meter homebrew rig for ten years when the commercial transmitter made its debut in 1963.*

for short. If you operated 6 meters and lived in an area served by a television station on channel 2, add one more initial to the acronym: *I* for *TVI.* Channel 2 wasn't the only problem, although it probably was the worst case. Several of the higher numbered (VHF) channels were also possible trouble. All over the country, only the baldest of 6-meter men weren't pulling their hair out.

Ed Ladd crusaded with evangelical zeal to convince his fellow amateurs that 6-meter operation and television could coexist—even the dreaded channel 2! He built filters for both transmitters and TV sets, worked out improved amateur transmitter designs, and investigated different operating techniques. His findings were published in a lengthy two-part article that ended with encouragement to get on 6 meters and operate.[4] Elements of the original Lulu design were presented in the article, and both the homebrew and commercial versions of the transmitter followed that recipe.

Bill Pasternak, now WA6ITF, recalls an incident from his teenage, 6-meter days in Brooklyn, circa 1959. His homebrew transmitter knocked out TV channels 2 through 5 so effectively that operation was restricted to the late-night hours. One of his wee-hours QSOs was with nearby K2IGK, who described his own homebrew rig as TVI-free. Bill paid a visit to IGK's Brownsville QTH at the first opportunity and was astonished to see the transmitter operating in close proximity to an old Dumont television set. The astonishing thing was the complete lack of TVI. The transmitter was a Li'l Lulu.

Whippany Labs introduced the commercial version of the Li'l Lulu transmitter in mid-1963, turning out more than 250 units over the next several years. Its sibling receiver never did become a true production model, although half-a-dozen prototypes were fabricated for beta-testing. Features designed into the transmitter and Whippany's own literature seem to indicate the Lulus were meant to be an ensemble from the beginning. The receiver didn't appear in ads until early 1965, and vanished for good in mid-'66.

The transmitter was already well-known to 6-meter veterans before it made its commercial debut. Untold numbers of homebrew Li'l Lulus had been built since Ed Ladd penned the basic transmitter design a decade earlier. His immediate goals included creating a high-quality portable/mobile/fixed station rig offering good performance in a compact package. As a bonus, his design was recognized as a good construction project for radio clubs and many were built this way. Ladd was a longtime member of the Morris (NJ) Radio Club, and occasionally a homebrew Lulu transmitter with a Morris club pedigree still surfaces.[5]

## The Name, The Performance

Where did the unlikely sounding name come from? The apocryphal tale is that amateurs encountering the early homebrew versions remarked, "She's a little lulu," commenting positively on the transmitter's compact size and spirited performance. In need of a name for his rig, Ladd decided to look no further than that, so Li'l Lulu it became. The term was not unknown outside amateur radio at the time, either. In 1935, Majorie Buell created a *Saturday Evening Post* cartoon whose title character was a young girl named Little Lulu. By the mid-1940s she was everywhere, appearing in comic books, a newspaper strip, and animated cartoons; she was even the spokesgirl for Kleenex™. Figurines and other Lulu merchandise abounded; remnants of the craze are still visible today in the collectibles section of online auction sites. Lulu's popularity may have had an influence on Ladd. I don't know. It *is* a cute name, though, and friendlier-sounding than the Black Widow appellation chosen by another manufacturer of 6-meter gear.

It's not so much what's in a name, but what's inside the box and how it performs on the air that matters with radios. The Li'l Lulu evolved as it progressed from club project to commercial product. Some constructors tailored the rig to suit their specific situations or made modifications to use parts already on hand. When the radio was used mobile, the car's electrical system might have dictated one's tube choice or filament wiring. Up until 1955 or '56 (depending upon brand) most American automobiles had 6-volt electrical systems, 12-volt thereafter. Early radios, or those built later but used in older cars, likely were wired for 6 volts. Constructors usually tried to stay faithful to the basics of the original design, however, in order to capitalize on its virtues.

Central to the original concept was the 6BH6 VFO, the grid circuit of which tuned 25–27 MHz, doubling in the plate circuit for output on 6 meters. The VFO's plate voltage and heater voltage were both regulated. The buffer's heater voltage was also regulated, but that was done only to properly load the 3TF4 regulator. A second 6BH6 acted as a buffer stage as well as a driver for the 12DQ7 power amplifier. The final amplifier's output circuit and the L/C circuit following the buffer were tuned by variable-capacitor sections ganged on the same shaft as the VFO's tuning cap. The rest of the transmitter's tuned circuits tracked with the VFO and gave the rig single-knob tuning as the operator moved about the band. The VFO was an effective solution to the harmonic-related TVI problems associated with transmitters using crystals or VFOs on lower frequencies. The ganged, sharply tuned circuits were also effective in attenuating unwanted signals.

The final amplifier was link-coupled to the antenna through a low-pass filter. Once a preliminary tune-up was done using the PA and ANT TUNE controls to peak the power meter for a maximum reading, the VFO knob kept the transmitter's circuits in resonance when changing frequency. How far one could move about the band without readjusting the tune-up controls depended upon the reactance of the antenna. Link coupling was also beneficial in the reduction of unwanted signals. A half-wave, low-pass filter with attenuation ranging from 31 dB for the second harmonic to 59 dB at the fourth followed the tuned output link. The 12DQ7 final was cathode-keyed for CW. A 12V6 plate-modulated the 12DQ7 final using a form of Heising modulation. A 12AX7 provided two stages of speech amplification in a single tube envelope. Its input circuit accommodated either crystal or carbon microphones. Each type of mic had its own front-panel jack, wired for push-to-talk operation. AM phone was the dominant voice mode when Ladd created his design in the early 1950s. When the commercial version appeared, hams were already starting to look beyond basic CW and AM-only rigs.

The internal supply powered the rig on either 117 volts AC or 12 volts DC. The 12-volt supply functioned with either positive or negative ground, the former handy if your mobile operation took place in a vintage British sport car, where positive earth and Whitworth fittings were standard fare. Whether the volts were American or British, they needed to be higher than the nominal 12; the transmitter would perform as rated only if run on the 13+ volts supplied by the electrical system of a running automobile. The DC supply employed a pair of transistors in a switching circuit and a second winding on the transformer primary. The high-voltage supply used solid-state rectifiers. The transmitter's power supply also provided plate and filament voltage for the Li'l Lulu receiver at an accessory socket on the rear panel.

When the station's antenna feed line was connected to the transmitter's SO-239 connector, an internal relay switched the antenna to an adjacent BNC jack on receive, with only a short coax jumper to a companion receiver necessary to complete the station hookup. Another set of relay contacts lifted the receiver's B+ voltage on transmit, performing the mute function. The transmitter was rated for 6 watts output CW and 5 watts on AM. It measured 5$^3/_8$" H × 8" W × 11$^3/_8$" D and weighed 16$^1/_2$ lbs. It sold through dealers for $225.00.

With the advantage of so many homebrew units already in the field, the commercial transmitter was quickly developed and brought to market. Magazine ads for the transmitter first appeared in April 1963; rigs were in owners' hands and on the air early that summer. No record exists of a similar homebrew or club-project Li'l Lulu receiver during the decade in which the homebrew transmitter was so popular. It seems clear that the transmitter and receiver were meant to be developed as a pair from the beginning of the commercial venture. Three sources place the number of transmitters manufactured at 255, while the total number of receivers is 5 or 6.

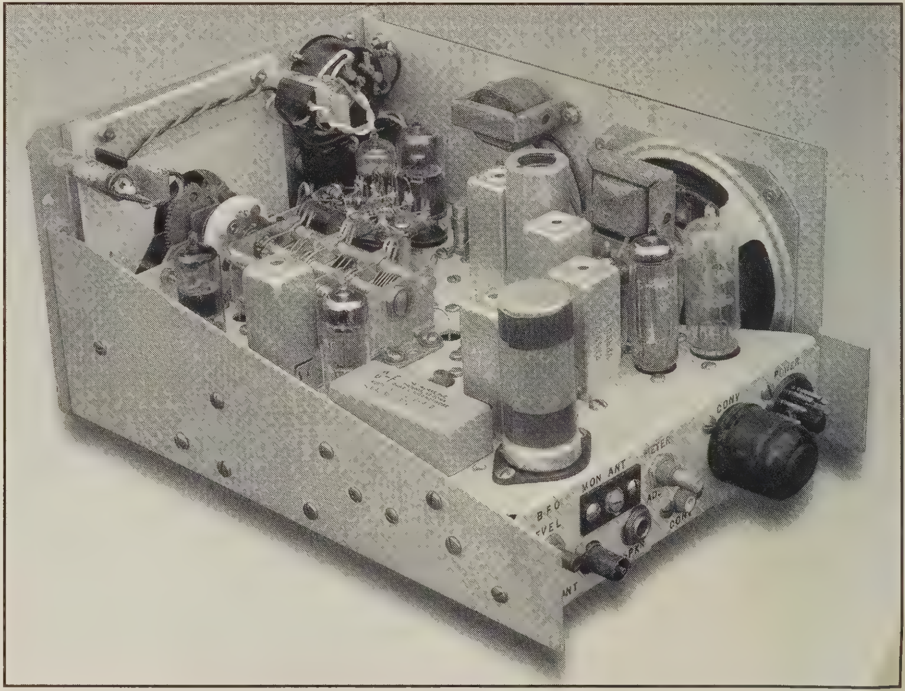
## The Li'l Lulu Receiver

Each of the known receivers differs slightly from the others, with the most prominent changes being in the RF amplifier and AGC circuits. Several people who knew Ladd and were also familiar with the Lulu project say the receivers were all beta-test models used to try out the different circuits before a final design was chosen for production. It has also been suggested some receivers were made for buyers who agreed to purchase one together with a transmitter. Matching serial numbers give credence to this speculation, and Van, WØVAN, owns such a pair.

In size and style the receiver is a cosmetic match to the transmitter. It weighs less because it has no power supply. The 12-tube circuit lines up as follows: 12BZ6, RF Amplifier; 6BH6, Mixer; 6BJ6 1st IF; 6BH6 (6BJ6 in some receivers), 2nd IF; 12KL8, 3rd IF; 3TF4, Filament Regulator; OB2, 105-volt Regulator; 6BH6, VFO; 12AV6, 1st AF; 12BY7 (12DQ7 in some receivers), 2nd AF; 12AL5, Automatic Noise Limiter; 12BE6, Product Detector. A 4-kHz bandwidth crystal lattice filter ahead of the amplifiers in the 10-MHz IF provided selectivity. The Li'l Lulu also had a front-panel switch position for receiving WWV at 10 MHz and another to employ the receiver as an IF for converters.

The original transmitter manuals, which have a finished look about them and were obviously typeset, talk about the receiver as if it were accomplished fact. The manual gives instructions for hooking it up and using it with the transmitter. The receiver's manual has the look of having been composed on a typewriter and speedily reproduced, rather than being the product of a print shop.

The receiver made its first appearance in a magazine ad in January 1965 and was in that year's *ARRL VHF Manual* as well. It continued to show up in ads, either by itself or paired with the transmitter, for the next year-and-a-half



*Despite being prototypes, the Li'l Lulu receivers are neatly wired and nicely finished. The two I've seen have internal speakers, contrary to what is stated in the ads.*

### Ed Ladd, W2IDZ

Francis E. Ladd was born on July 20, 1914 in West Lebanon, NH. He was first licensed as W1GHD in 1933 in Reading, MA. That same year, when he heard a station in Tennessee—a thousand miles away—calling CQ on 5 meters, he wasn't sure if he should believe it or not. This was at a time when older, wiser 5-meter heads were struggling to bridge the Boston, MA to Hartford, CT gap, a distance of barely a hundred miles. By 1935 he was W2IDZ, the call he would hold for nearly sixty years.

Ed Ladd's professional life revolved around communications, too. He worked as a Member of the Technical Staff at Bell Laboratories, spending much of his career at the facilities in Holmdel and Whippany, NJ. The second location seems to factor, tongue-in-cheek fashion, into the name Ladd chose for the company that manufactured the Li'l Lulu gear. His superiors at Bell probably would not have been amused at any implied connection.

Ladd worked on satellite networks in the Earth Station Design and Implementation Group and projects involving troposcatter communications. Also in his resumé is work on air/ground communications for both the Strategic Air Command and the presidential aircraft. Ed Ladd retired from Bell Laboratories in 1984 and died on July 9, 1994.

before disappearing completely. Apparently, during that time nothing more than the handful of prototypes was produced. A handwritten entry in one of WØVAN's transmitter manuals notes, "New from factory, 29 April 1967," so business may have continued on quietly for a while after the advertising ceased. Meanwhile, competing companies such as Clegg, Gonset, and even Heathkit were selling 6-meter transceivers—sideband transceivers—for the same money the Whippany pair cost. Part of the problem with producing the receiver was that Whippany Labs couldn't really charge as much as it cost to manufacture it. The initial production cost had been grossly underestimated, and after the long delays in getting it to market, the price point could not be both competitive and profitable. The old joke "We lose a little on each one but we make it up in volume" was not humorous to Ed Ladd. In the end, he chose not to compromise his effort by cheapening his product, or take an AM knife to a sideband gunfight.

## In Closing . . .

At another time, in a different market, the Li'l Lulu line might have made a stronger showing. Ladd had already completed construction of a prototype 2-meter converter to use with the receiver and finished the design of a 220-MHz unit. A 117VAC/12VDC power supply, independent of the transmitter, had also been designed and constructed for the receiver.

Thanks to those who contributed to this column about the Li'l Lulus and their creator. The receiver in the photographs belongs to Bill Strangfeld, W8FIX. The transmitter is owned by Herman Cone, N4CH. Herman contributed much documentation on the transmitter as well. Michael Hopkins, AB5L, is the *Keeper of the Flame* on all things from 6 meters' Golden Age and was instrumental in supplying details on the Lulus' life and times. Pete Markavage, WA2CWA, who can supply you with a manual for just about anything, worked with Ed at Bell Labs. He furnished information for the human side of the story as well as technical details about the equipment, especially the receiver. Bill Wadsworth, W2ZKE, was a friend of Ladd's and a fellow member of the Morris Radio Club. I appreciate his taking time to reminisce about ham radio experiences covering several decades. Thanks to Bill Pasternak, WA6ITF, for the report from TVI-land. Van Becker, WØVAN, who has a nice Li'l Lulu collection, gave thoughtful answers to my many questions and e-mailed sharp, detailed photos when that would do better than words.

73, Joe, K9OCO

## Notes

1. Ross Hull, "Air Mass Conditions and the Bending of Ultra-High Frequency Waves," *QST,* June 1935, 13–15.
2. Ross Hull, "Extending the Range of Ultra-High Frequency Amateur Stations," *QST,* October 1934, 10–13.
3. Frank C. Jones (W6AJF), "Checking the Behavior of Ultra-High Frequency Waves," *QST,* March 1933, 14–17.
4. Francis E. Ladd (W2IDZ), "50 Mc. TVI – Its Causes and Cures" (Part I), *QST,* June 1954, 21–23; Ladd, "50 Mc. TVI – Its Causes and Cures" (Part II), *QST,* July 1954, 32–33.
5. <http://www.qsl.net/wb1asl/lulu.html>: A homebrew Li'l Lulu of unknown provenance, but perhaps typical of the many units constructed before the commercial transmitter came along.

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what's new

BY KARL T. THURBER, JR.,* W8FX

# High-Power VHF/UHF Amps, Power Supplies, Telescoping Poles, and more

This month in your "What's New" column we'll again present some noteworthy radio gear, hamshack accessories, antennas and antenna accessories, portable and mobile goodies, and other fascinating items that have been rolled out recently. Let's dig right into "What's New."

## Radio Gear

**High-Power VHF and UHF Amplifiers from InterTronic Solutions.** According to Peter Shield, G8BXM, of InterTronic Solutions, the Discovery series of high-power amplifiers takes advantage of the low-cost GS31/35 series of high-power ceramic/metal construction triode tubes. These hefty tubes help provide reliable, low-cost, high-power amplifiers for the 6- and 2-meter amateur bands (see photo A). The amplifiers, made by Linear Amp UK Ltd., and newly introduced to North America, reportedly produce more CW power from a desktop unit than anything else available at a similar price. The amplifiers use a very large integral toroidal power transformer and a high-power integral cooling fan for quiet and reliable high-power operation.

The 6- and 2-meter amplifiers produce 1200 or 1500 watts CW for long key-down periods with 80-100 watts of drive; 1.25-meter and 70-cm band versions of the amplifiers also are available. The Discovery series features a number of very useful features, including a "soft start" circuit and a three-minute startup timer. There also is protection for plate over-current, grid over-current, over-drive, and internal tube flashover. High-power RF coaxial changeover relays are built-in, as is an output power meter. The 1200-watt units sell for $2299 and the 1500-watt units sell for $2499; these prices include full shipping.

Linear Amp UK Ltd. is Europe's largest manufacturer of tube-based high-power amateur radio amplifiers. The full product line now is available in North America from InterTronic Solutions, Inc., 452 Aime-Vincent, Vaudreuil-Dorion, Quebec, Canada J7V 5V5 (450-424-5666; e-mail: <info@intertronicsolutions.com>; on the web: <http://www.intertronicsolutions.com>).

*Photo A– The UK-based Discovery series of linear amplifiers distributed by InterTronic Solutions, Inc. are economically priced 1200- and 1500-watt desktop amplifiers for 2 and 6 meters. The 1200-watt units sell for $2299 and the 1500 watt units for $2499, shipping included. (Photo courtesy of InterTronic Solutions)*

## Accessories for the Shack

**I-Mate from The BetterRF Company.** Several years ago, we profiled the popular 706 Tune Control accessory. To recall, it's a handy plug-in device to enable the Tune/Call button on the ICOM 706 transceiver, offered by The BetterRF Co. The company's motto holds that it is "dedicated to providing superior products to the amateur community." Now the same crew—Gerry Smith, W6TER, and Jim Van Putten, W8QT—has introduced another product, the I-Mate (photo B). It's said to be ideal for chasing DX and contesting.

I-Mate implements the external selection of prerecorded voice and keyed messages for the ICOM 756 PRO II transceiver and keyed CW messages for the ICOM 746 Pro. The new accessory eliminates the necessity for shifting the display from an operating mode to a memory select mode simply to transmit the prerecorded message. Pressing one of four buttons on the I-Mate transmits the message associated with that button.

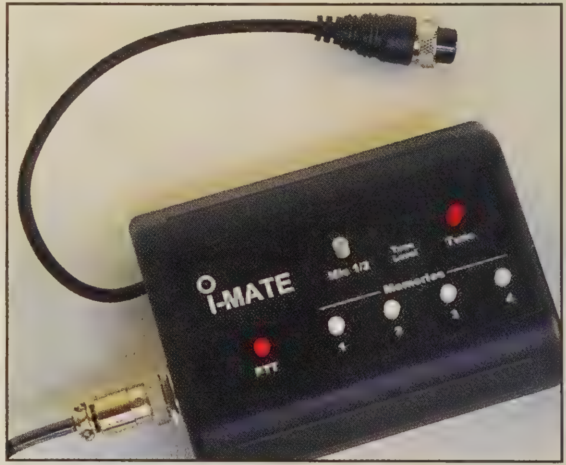

*Photo B– The BetterRF Co. has introduced a very handy accessory, the I-Mate, said to be ideal for chasing DX and contesting. I-Mate implements the external selection of prerecorded voice and keyed messages for the ICOM 756 PRO II transceiver and keyed CW messages for the 746 Pro. (Photo courtesy of The BetterRF Company)*

The I-Mate also provides a pulsed sine-wave oscillator for the tuning of high-power amplifiers and

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*289 Poplar Drive, Millbrook, AL 35054-1674
e-mail: <w8fx@cq-amateur-radio.com>

# Substitutes for the WD-11

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*E-Mail: radiowd11@yahoo.com*

---

**W**estinghouse introduced the WD-11 tube in 1922 for their Aeriola, Sr. (Model RF). They needed a tube which could be heated with dry cells instead of storage batteries. The WD-11 was also used in the RS, Regenoflex, Radiola X, Radiola III and Radiola III-A, sets made for RCA by Westinghouse. The development of this tube is well documented [1].

General Electric developed the UV199 tube independently, with the same objective of economical dry cell operation. The UV199 was introduced in 1923 with the Radiola IV. Its characteristics were similar to the WD-11 except for the filament demand of 3.3V/.06A vs. 1.1V/.25A for the WD-11. Besides its filament economy, the UV199 was also more robust and less microphonic.

The filament structure of the WD-11 is notoriously delicate. When a filament burns out, it may flop against the plate applying B+ to the filament circuit with disastrous results [2]. RCA chose the UV or UX199 for subsequent superheterodyne and regenerative receivers. No apparatus using the WD-11 was designed after 1924, and it became obsolete so quickly that RCA issued Service Bulletin #6 (Dec. 11, 1925) showing how to convert the Radiolas III and III-A to UX199 and UX120 tubes [3].

Westinghouse issued the WD-12, a UV-based version of the WD-11, in 1923. It was replaced by the UX-based WX-12 in 1925 for converting storage battery sets to dry cell operation. The Crosley "Pup" appears to be the only radio factory-designed for the WD- or WX-12. The WD-11 and WX-12 were dropped from the official RCA product line in 1933 [4].

Those who want to play these early sets have a tube problem. RCA quit stocking WD-11 tubes 70 years ago. Today they are prohibitively expensive, being worth more than the radios using them. Because of their value, those who have WD-11s are reluctant to put them into service.

UX199s can be used per the RCA bulletin. Adapters are still around, but both are quite expensive. The 864 (VT-24), developed for aircraft use, is a popular substitute because it has the same filament requirements and similar characteristics, but is also now quite expensive.

The Type 30 has been used as a substitute, but is both expensive and requires an oddball filament voltage. Another substitute is the Loctal 3D6, a beam pentode, connected as a triode and used with an adapter. Its filament requirements are similar to the WD-11. Miniature pentodes (1L4, 1S4, 3S4, 3Q4, 3V4) used in the same manner have also been described [5].

Another elegant solution is to use a miniature, wire-lead 5676 in a WD-11 base. A silvered test tube can be fastened over it over it to give the appearance of a WD-11.

### Testing Possible Substitutes

I decided to carry out some tests on possible substitutes that would be cheap, plentiful, functional and resemble the WD-11. A look at the tube manual uncovered the following possibilities:

| Tube | Fil. V/A | Bias V | Plate mA | Gm | µ | Base | Price-$ |
|---|---|---|---|---|---|---|---|
| WD-11 | 1.1/.25 | -4.5 | 2.8 | 400 | 5.6 | Unique | 100+ |
| 864 | 1.1/.25 | -4.5 | 2.9 | 610 | 8.2 | 4-Pin | 25-35 |
| 1G4 | 1.4/.05 | -6.0 | 2.3 | 825 | 8.8 | Octal | 10-12 |
| 30 | 2.0/.06 | -4.5 | 2.5 | 850 | 9.3 | 4-Pin | 16-20 |
| 1LE3 | 1.4/.05 | -3.0 | 1.3 | 760 | 14.5 | Loctal | 4-5 |
| 1Q5 | 1.4/.10 | -4.5 | 5.8* | 1075* | 7.8* | Octal | 3-4 |
| 1A5 | 1.4/.05 | -4.5 | 5.6* | 1070* | 8.0* | Octal | 3-4 |
| 1LA4 | 1.4/.05 | -4.5 | 5.5* | 1065* | 8.1* | Loctal | 4-6 |

# Troubleshooting Chart

The following chart lists conditions and possible causes of several specific malfunctions. If a particular part is mentioned (Q7 for example) as a possible cause, check that part to see that it is installed and/or wired correctly. It is also possible, on rare occasions, for a part to be faulty and require replacement.

| CONDITION | POSSIBLE CAUSE |
|---|---|
| No signals can be received on any band. However, headphone noise is heard when the AF Gain control is advanced. | 1. Transistor Q1 or IC1 is incorrectly installed or shorted. |
| No signals are received on the 3.5 MHz band. | 1. Diode D1 or D5 incorrectly installed or shorted. |
| No signals are received on the 7.0 MHz band. | 1. Diode D2 or D6 incorrectly installed or shorted. |
| No signals are received on the 14.0 MHz band. | 1. Diode D3 or D7 incorrectly installed or shorted. |
| No signals are received on the 21.0 MHz band. | 1. Diode D4 or D8 incorrectly installed or shorted. |
| No sound of any kind from the headphones. | 1. Transistor Q201 or IC2 incorrectly installed or shorted.<br>2. Phone jack J301 incorrectly wired. |
| Heterodyne frequency oscillator does not operate on any band. | 1. Transistor Q6 incorrectly installed or shorted. |
| Heterodyne frequency oscillator does not operate on one band. (Other bands are OK.) | 1. The associated diodes for the inoperative band (D22 thru D29) may be incorrectly installed or shorted.<br>2. The crystal for the inoperative band may be faulty. |

* Triode-connected (screen tied to plate)
All values with Ep = 90V

The first four tubes are shown for comparison purposes only. Types 1G4, 30 and 864 are not good candidates due to their high cost. The last three turned out to be good possibilities. Characteristics of the triode-connected 1Q5, 1A5 and 1LA4 are not listed in tube manuals and had to be measured. The 1Q5 is a beam power tube and the 1A5 a power pentode. The 1LA4 is a 1A5 with a Loctal base. The characteristics of the other tubes were taken from the tube manual.

RCA recommends that the Radiola III-A be operated with 22.5V on the detector and 90V with -4.5V bias on the three amplifier tubes. Accordingly, the transfer characteristics of the WD-11, 864 and the possible substitutes were examined at Ep = 90V.

Fig. 1 shows the results. The WD-11, 1Q5 and 1A5 have long, linear transfer curves. The 864 and 1LE3 have a much narrower operating range. The steeper slope of the 1Q5 and 1A5/1LA4 reflect their higher transconductance. All the tubes have similar amplification factors (μ) except for the 1LE3 which is nearly twice that of the others.

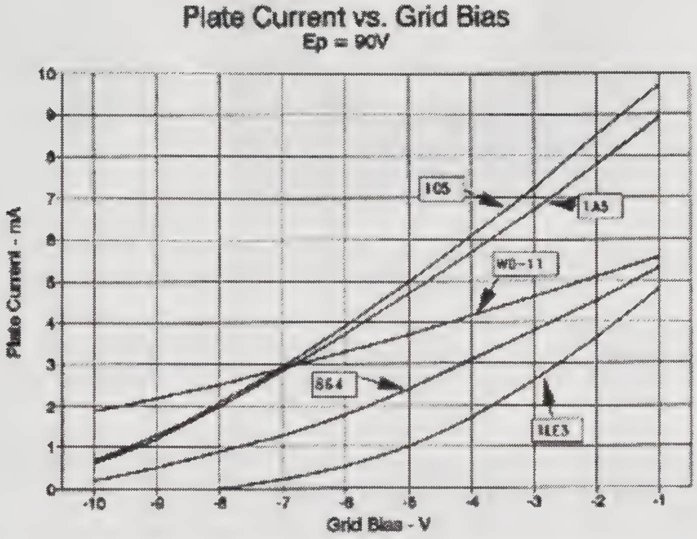

Fig. 1. Transfer characteristics of the WD-11, 864, and possible substitutes.

**Making a WD-11 Base Template**

Because of the unique WD-11 base, substitutes must either be re-based or provided with adapters. Re-basing yields good looking results, but when it's time to replace the tube, you have to do everything all over again. Adapters are easier to make and use and involve less risk to the tubes. When the tube is worn out, just plug in a new one. There are some adapters sold commercially, but they are expensive.

You can make your own adapters at very little cost using old 4- or 5-pin bases from dud tubes. These should be the small, 1-1/8" diameter bases. It is easier to drill new holes in 4-pin bases, but 5-pin bases can also be used. A template will simplify your work.

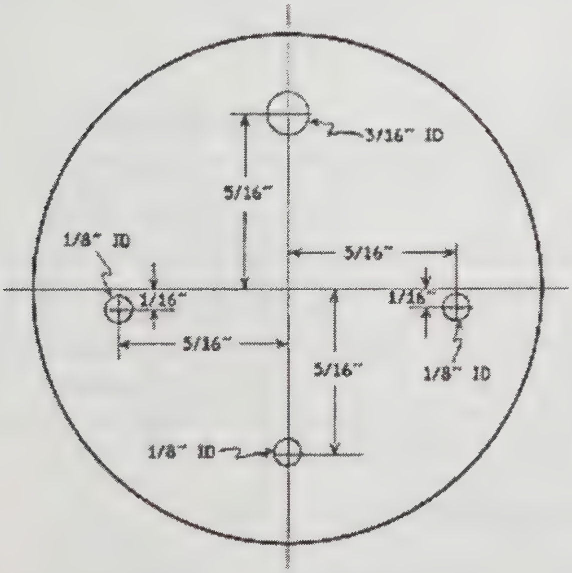

Fig. 2. Layout of drilling template for WD-11 base.

The WD-11 pin layout is shown in Fig. 2. The template was made from a scrap of 1/4" thick Plexiglas about 2" square from the local glass shop and a similar piece of Bakelite from an old radio panel. Lay out the pin locations on the Plexiglas as shown. Use a sharp scribe and be accurate. Drill one 3/16" hole and three 1/8" holes where indicated. If you spot the holes first with a center drill, the main drill will run true. A drill press is essential for precision. Also drill a 1/8" hole at the center of the pin circle for later use.

Now, clamp the Plexiglas and Bakelite pieces together and drill two holes near opposite corners for bolts to hold the two parts together. Bolt the parts together and, using the center hole as a guide, drill through the Bakelite with the 1/8" drill.

This hole in the Bakelite is the pilot hole for a 1-1/8" hole saw which you will next use to make a hole in the Bakelite to fit the tube base to be adapted. This hole may need a little filing or sanding

## TROUBLESHOOTING CHART (cont'd.)

| CONDITION | POSSIBLE CAUSE |
|---|---|
| Sidetone does not operate. | 1. Diode D21 or IC2 is incorrectly installed or shorted. |
| Relay does not operate. | 1. Transistor Q12 or Q13 is incorrectly installed or shorted. |
| Relative power meter does not operate. | 1. Trimmer capacitors, C95, C99, C103, C106, and C303 are not properly adjusted.<br>2. Transistor Q8, Q9, or diode D301 are incorrectly installed or shorted. |
| Relative power meter does not operate on one band only. | 1. The trimmer capacitor for that band (C95, C99, C103, or C106) is not properly adjusted.<br>2. The diode associated with that band is incorrectly installed or shorted. Diodes D16, D17, D18, D19, D31, D32, D33, D34, D35, D36, D37, or D38.)<br>3. The heterodyne frequency oscillator is not properly tuned for that band. |

to get a snug fit. Fig. 3 shows the template and Bakelite bolted together.

### Making a WD-11 Base

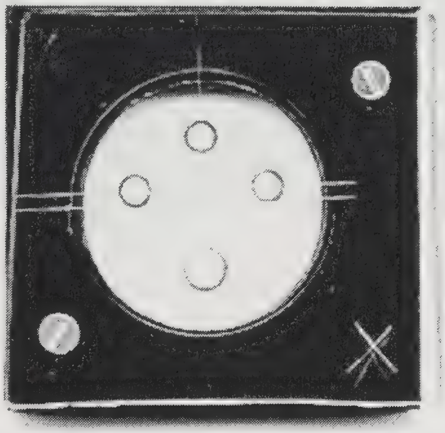
Fig. 3. Completed template assembly with Plexiglas and Bakelite pieces bolted together.

Remove each of the existing pins on your tube base by holding it with pliers so it can't rotate and drilling away the flange from the inside. When the flange is removed, the pin will pull out easily. Use a drill of the correct diameter to remove the flange without removing any Bakelite. Scrape all the old cement out of the base. Insert the base into the template so the bottom is against the Plexiglas. You can now easily see how to position the base so that the new holes will lie between the old holes.

Drill a 3/16" hole in the base using the hole in the template to guide it. Insert a small piece of 3/16" rod through both template and base to prevent slippage and drill the three 1/8" holes and one 3/16" hole. The new pins are made from thin-wall brass tubing in 3/16" and 1/8" diameters from a hobby shop. This tubing is full diameter, while the holes will be slightly undersize, therefore the new pins will fit tightly and need no anchoring.

Cut the tubing to 1-3/4" length. I use a miniature tubing cutter from the hardware store. It gives a rolled edge at the cut which makes insertion and soldering easy. The best way to insert the pins in the base is to chuck them in your drill press and use the press to push them in. Make two 9/16-long collars to use as depth gauges. Drill one to slip over the 3/16" pin and one to slip over the 1/8" pins. I made these from tubular spacers.

Start the brass tubing into the base by lightly tapping it with a small hammer. Then slip on the collar and press the tubing into the base until its end is flush with the end of the collar. Watch it closely to be sure it goes in straight. Now your pin will protrude the correct distance from the base.

### Fabricating Adapters

The sockets I used to make adapters for the substitute tubes came from the junk box. They were the molded Bakelite kind with molded-in mounting plates. The diameter below the plate is about one inch so they fit snugly into the bases with just a little filing. Cut off the mounting ears with tin snips, but leave the rest of the mounting plate in place. Wiring of the adapter will depend on the type of tube you are using as a substitute. Diagrams for the 1LA4/1LE3 and 1A5/1Q5 are shown in Fig. 4. The resistor across the filament connections needs explanation.

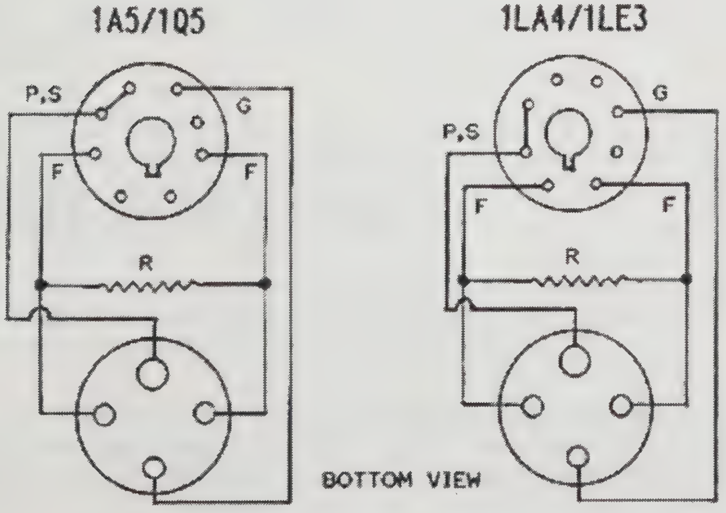

Fig. 4. Wiring diagrams for adapters. See text for function of resistor "R."

Volume in these old sets is controlled by varying the filament voltage through a rheostat. It is sized for use with 0.25A tubes. Because the substitutes draw only 0.05 to 0.1A, the rheostat will have little effect on filament voltage and the set will run wide open with no volume control action.

For substitutes to behave like WD-11s, they must draw similar filament currents. The 1/4-watt resistor, R, shunting the filament increases the total circuit current to about that of a WD-11. This will give good volume control action. R should be 6.8 ohm for the 1Q5 and 5.1 ohm for all other tubes.

# SPECIFICATIONS

## TRANSMITTER

| | |
|---|---|
| DC Power Input | |
| 80 meters | 3.5 watts. |
| 40 meters | 3.0 watts. |
| 20 meters | 3.0 watts. |
| 15 meters | 2.5 watts. |
| Frequency Control | Built-in VFO. |
| Output Impedance | 50 Ω unbalanced. |
| Sidetone | Built-in, adjustable volume. |
| Spurious and Harmonic Levels | At least 35 db down. |
| Transmit Frequency Offset | Approximately 750 Hz lower, fixed on all bands. |

## RECEIVER

| | |
|---|---|
| Receiver Type | Direct conversion with RF amplifier, balanced product detector, and active audio filter. |
| Sensitivity | 1 microvolt or less for 10 dB $\frac{S+N}{N}$. 0.2 $\mu$V provides readable signal. |
| Selectivity | Wide — 750 Hz @ 6 dB down.<br>Narrow — 375 Hz @ 6 dB down. |
| Passband Center Frequency | 750 Hz. |
| Type of Reception | CW. |
| Audio Output Impedance | 1000 Ω nominal. |

Connect the resistor between the filament lugs on the socket and solder wires to them and to the grid and plate lugs. The wires can be bare except the one from the plate (or grid depending on how you orient the socket with respect to the base). This wire needs to be insulated where it crosses over the socket. Guide the wires through the pins in your WD-11 base, seat the socket firmly in the base and solder the wires to the pins.

Drill two small holes on opposite sides of the base into the edge of the socket. Make sure that the holes go between socket pins. The diameter of the hole will depend on the size of the self-tapping screws you use to fasten the socket to the base. It is a good idea to experiment on some scrap Bakelite before drilling the sockets.

I use #0 x 1/4" or #1 x 1/4" screws. Using a larger drill, enlarge the hole in the base shell so that the screw passes freely. Do not drill into the hole in the socket edge. Insert the screws to hold the base and socket together. Don't over tighten them or you may crack the shell.

Fig. 5 shows (A) a WD-11 tube, (B) a re-based 864, (C) a 1LE3 in its adapter, and (D) a 1A5 in its adapter. The superficial resemblance of the substitutes to the WD-11 is obvious. Details of the adapter construction are also visible.

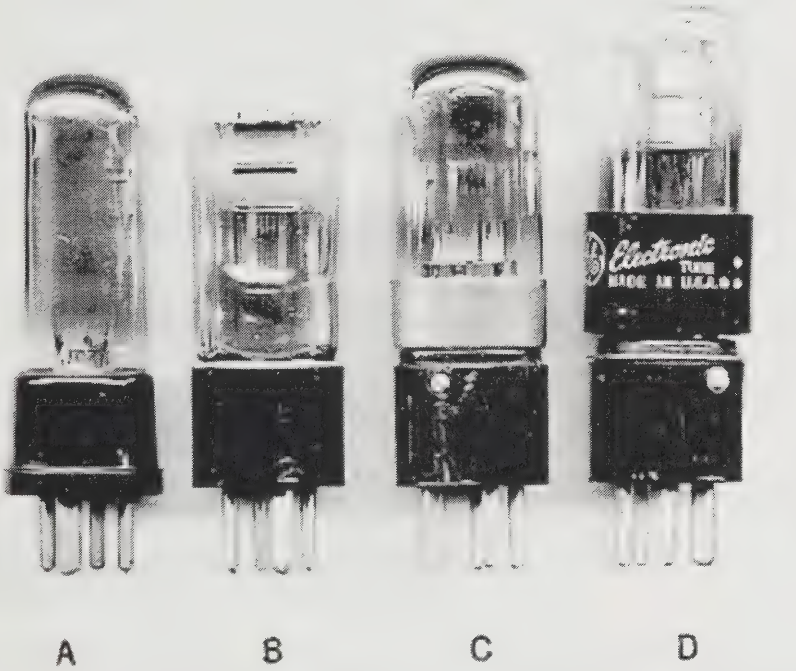

Fig. 5. From left: WD-11 tube; re-based 864; 1LE3 in its adapter; 1A5 in its adapter.

## Testing the Substitutes

A Radiola III-A was equipped with WD-11 tubes and its operation studied. This set has 2 sections: a regenerative detector and an AF amplifier followed by a push-pull second audio output stage. There is provision for headphones after the first audio stage and each section has its own filament rheostat.

Because of the various interacting adjustments to be made for proper reception, there could be no "standard" setting for comparing tubes. so the test was subjective. In each case, a weak station was tuned in and the positions of the filament and regeneration controls noted at the settings for loudest volume and best sound quality. The position of the regeneration control at which oscillation occurred was also noted.

The set was operated with 22.5V on the detector and 90V on the audio amplifiers with -4.5V bias. The filament supply was 1.5V. A voltmeter was connected across the filament pins so as not to exceed 1.1V for the WD-11s. At first, only the "front" half of the set was operated (detector + first audio) with headphones.

Using WD-11s, the set was adjusted for best volume and sound. Then the WD-11s were replaced first with 1LE3s, then with 1A5s, and the set re-adjusted for optimum reception in each case. You'll recall that the 1LA4 is electronically identical with the 1A5.

The 1LE3s were rather touchy. Oscillation onset occurred at a much lower setting of the regeneration control and the filament control had to be reduced to avoid distortion. Nevertheless, performance was satisfactory and quality was acceptable. The volume was louder because of the higher μ of the 1LE3.

The 1A5s also oscillated at a lower setting than WD-11s and required reduction of the filament voltage, but overall performance was much smoother than the 1LE3 and distortion was less at high volume.

## GENERAL

| | |
|---|---|
| Frequency Coverage | 80 meters, 3.5 to 3.75 MHz.<br>40 meters, 7.0 to 7.25 MHz.<br>20 meters, 14.0 to 14.25 MHz.<br>15 meters, 21.0 to 21.25 MHz. |
| Frequency Stability | Less than 150 Hz/hour drift after 60 minute warm-up. |
| Frequency Generation | Premixed VFO and HFO. |
| Power Requirements | 13.4 volts DC, nominal. 90 mA receive mode, and 430 mA transmit mode. |
| Dimensions | 9-1/4" wide x 8-1/2" deep x 4-1/4" high, including knobs and feet.<br>(23.5 cm wide x 21.6 cm deep x 10.8 cm high.) |
| Weight | 4 lbs. (1.8 kg.) |

The Heath Company reserves the right to discontinue products and to change specifications at any time without incurring any obligation to incorporate new features in products previously sold.

A horn speaker was then connected to the second push-pull audio stage and the filament rheostat turned on. There was a noticeable tendency for the 1LE3s to distort at high volume levels, but satisfactory room-level sound could be achieved with filament adjustment. As before, the 1A5s were smoother and more like WD-11s in operation. Distortion was less; room-level sound was easily achieved. In all cases, volume control action was as good as with WD-11s.

After similar tests were done with 1Q5s, it was found that there was little perceptible difference in the performance of 1A5s, 1Q5s and 1LA4s. In conclusion, I prefer the 1A5 or 1Q5 for a substitute. They are cheap and available and perform very much like the WD-11. The 1LA4 works just as well, but is a bit more expensive. If you happen to have some 1LE3s on hand, however, they are also functional and will do the job.

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BACK TO OTB TABLE OF CONTENTS

OTB
ON-LINE
| OTB HOME | ABOUT AWA | CURRENT ISSUE | ARCHIVE ARTICLES | JOIN AWA |

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This ought to be coming again soon—
for 1936 models—

# Looking Over the Circuits of the New Amateur-Band Superhets

## Salient Technical Features of the Latest Manufactured Models

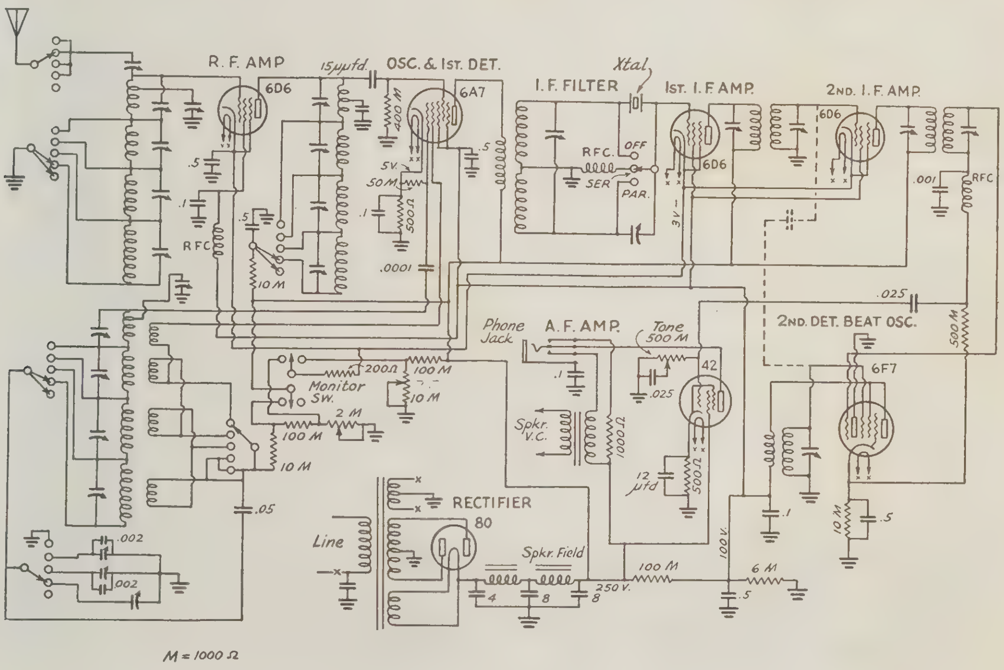
By James J. Lamb*

ONCE upon a time the simple statement, "It's a superhet," was sufficient to give us a pretty good picture of the innards of any one of the few receivers of that type that were then available. The circuit used (there was practically only one) embodied a first detector, a high-frequency oscillator, a couple of i.f. amplifier stages, a second detector with c.w. beat oscillator, and an audio amplifier. There was little variety in the way these essentials were strung together. But now the picture is changed. Where there were but a few models there are now many; and where there was but one "standard" circuit arrangement there is now a variety of essentially different combinations. With designers exercising their individual choice in diversified use of multi-purpose tubes, different methods of obtaining band-spread, i.f. stages ranging from one to four, several types of automatic gain control, a variety of i.f. filters, multiform band-changing devices, and then compounding the complication by adding original kinks of their own—well, with all this going on, most of us are hard put to remember how many tubes the Whatzit has, let alone to be familiar with what all the different circuits look like.

To summarize in one piece as much of this essential information as is possible, and thus do part of our job of keeping the gang abreast of the present state of the art, is the object of this article. Supplementing the circuit diagrams, salient technical features of the receivers will be sketched, taking the models in alphabetical sequence by manufacturer's name.

## Hallicrafter's Super-Skyrider

THE Super-Skyrider is of the Single-Signal type, having six tubes of the 6-volt variety in the circuit of the receiver proper in addition to the rectifier of the self-contained power pack. The speaker is also mounted in the same



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* Technical Editor *QST*.

cabinet, behind a screened opening in the panel. As shown in the diagram, the circuit line-up proceeds through one stage of tuned r.f. preselection tuned-impedance coupled to the combined oscillator and first detector, a crystal filter of the fixed band-width type, two i.f. stages using transformer coupling with air-condenser tuning, a combined second detector and c.w. beat oscillator, and pentode power output stage.

The tuning system is of the switching type having sectionalized coils and using a six-gang switch, one section being used exclusively for the oscillator padding condensers and the three for the main coils providing shorting of adjacent sections to minimize dead spots. Band spreading, both in calibration and tuning rate, is accomplished by mechanical and electrical methods in combination, an auxiliary gang condenser being used in parallel with the main gang and having its own calibration dial and reduction drive. Approximate band-spread figures[1] for the amateur bands are as follows:

1.75 mc. (in nearly 3 sweeps of band-spread range), calibration spread 1 kc. per scale division, tuning rate 25 kc. per knob rotation; 3.5 mc. (in 2.6 sweeps of band-spread range), calibration spread 2 kc. per division, tuning rate 60 kc. per knob rotation; 7 mc., calibration spread 4.5 kc. per division, tuning rate 130 kc. per knob rotation; 14 mc., calibration spread 8 kc. per division, tuning rate 240 kc. per knob rotation.

The crystal filter, which is switched in by a panel control for single-signal reception, is of the fixed band-width type with the phasing condenser variable from the front as an operating adjustment for rejecting an undesired interfering signal. The "transmit-receive" switch, when thrown to the "transmit" position, simultaneously disables the r.f. stage and changes the bias on the i.f. tubes to a sensitivity level suitable for monitoring the station's own transmitter. Additional panel adjustments are the combined power switch and tone control, beat oscillator and wave-change switches, and r.f. gain (volume) control. The beat oscillator frequency and monitor level adjustments are at the rear. The c.w. beat oscillator utilizes the screen-grid section of the 6F7 connected as a triode, the grid and cathode of the triode section being used as the diode second detector (with the triode plate grounded so as to be ineffective). The beat oscillator is capacity coupled to the grid of the second i.f. stage.

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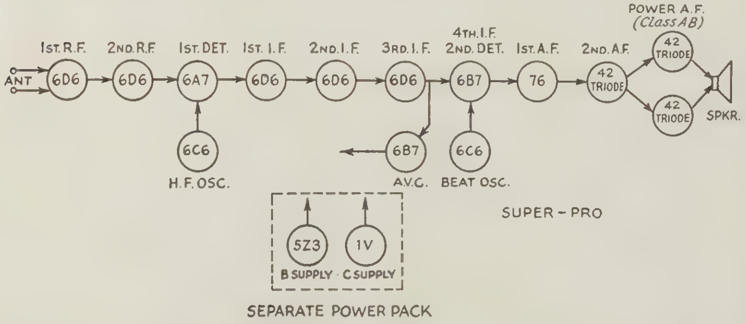
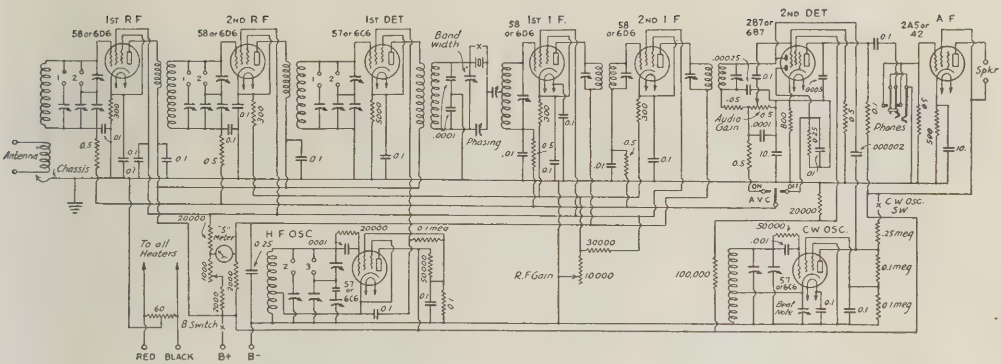
[1] For explanation of the description of band-spread figures, see the note on band spreading elsewhere in this issue.

## Hammarlund Super-Pro

HAMMARLUND'S new amateur type Super-Pro, scheduled for release in the near future, uses 14 tubes in the receiver circuit proper with 2 more as rectifiers in a separate plate- and bias-voltage power pack. A block diagram of the tube line-up is shown, the complete schematic not being available at the time of this writing. The circuit sequence starts with two stages of tuned r.f. pre-selection, followed by a pentagrid first detector with separate electron-coupled high-frequency oscillator, three stages of 465-kc. i.f. amplification with variable band-width air-condenser tuned transformers, and a pentode-diode type second detector which also furnishes a fourth stage of i.f. A second tube of this type serves exclusively for amplified a.v.c. which is not affected by the output of the electron-coupled beat oscillator and therefore can be used for c.w. as well as for 'phone reception. The diode detector is followed by a resistance-coupled stage of audio voltage amplification, a power driver stage and a push-pull power output stage operating Class AB. Both power stages use pentode tubes connected as triodes.



The tuning system is of the coil-switching type, the switch mechanism being a special slotted-cam operated design providing shorting of all coils except those actually in circuit. Five tuning ranges between 540 kc. and 22 mc. are covered in 2-to-1 steps by the main tuning condenser gang. Band-spread tuning is accomplished by an auxiliary gang which has an individual calibration scale and which is automatically cut in parallel



HRO

with the main gang by the coil switch on the three high-frequency ranges (above 2.5 mc.). Amateur band-spread data are given as follows:

3.5 to 4.0 mc., calibration spread 5 kc. per scale division, tuning rate 80 kc. per knob rotation; 7.0 to 7.3 mc., calibration spread 4 kc. per scale division, tuning rate 60 kc. per knob rotation; 14.0 to 14.4 mc., calibration spread 5 kc. per scale division, tuning rate 80 kc. per knob rotation. The three high-frequency bands come at the same tuning capacitance value, making it unnecessary to reset the main tuning condenser when switching from one to another.

Panel equipment includes a tuning meter and controls additional to the usual are provided for c.w. beat-note adjustment and ganged adjustment of the coupling of the i.f. transformers to vary band-width. The band-width range[2] of values obtained is given as from 2 to 7 kc. at 2X resonant input voltage, from 4.5 to 10 kc. at 10X and from 14 to 24 kc. at 10,000X. Resonance frequency (or tuning) is unaffected by variation of selectivity.

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[2] The method of describing selectivity in terms of band-width is explained in the article, "Receiver Selectivity Characteristics," in this same issue.

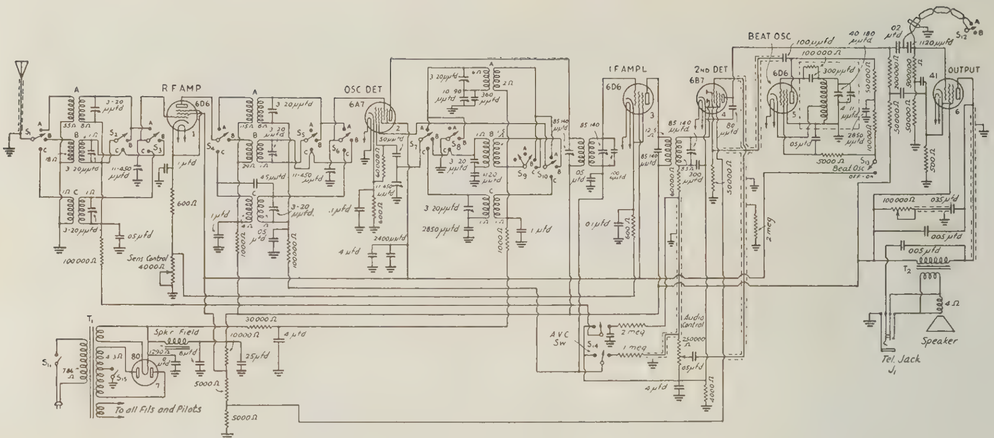
## National HRO

AS SHOWN in the diagram, the National HRO circuit contains 9 tubes, exclusive of the rectifier in its separate power pack. There are two stages of tuned r.f. pre-selection, pentode first detector and separate oscillator, variable band-width crystal filter, two 456-kc. i.f. stages, combination diode second detector and a.v.c. with pentode first audio stage, electron-coupled c.w. oscillator, and pentode power output amplifier. The tuning system utilizes four-gang plug-in assemblies, each containing aligning and tracking condensers individually pre-set for optional continuous-range or amateur band-spread tuning. The change from one method to the other is accomplished by shifting connecting screws. All tuning and adjustment condensers in h.f. and i.f. circuits are air-dielectric type. The normal tuning range is from 1.7 to 30.0 mc. in four steps, each of slightly more than 2-to-1 tuning ratio, coil assemblies for two additional steps extending the range down to 500 kc.

The four-gang tuning condenser is driven through a worm-type reduction gearing giving 10 knob rotations for 180-degree turning of the condensers. The calibration dial has an internal epicyclic geared scale reading in steps of 10 between 0 and 500. With the 50 scale markings on the main dial, calibration is direct reading to 1 part in 500. With the band-spread coil connections each amateur band is given a span of 400 divisions, making the calibration spread approximately 700 cycles per division on 1.75 mc., 1250 cycles on 3.5 mc., 650 cycles on 7 mc., and 1000 cycles on 14 mc. The corresponding tuning rates are 33 kc. per manual knob rotation on 1.75 mc., 56 kc. per rotation on 3.5 mc., 35 kc. per rotation on 7 mc., and 45 kc. per rotation on 14 mc.

The high-frequency oscillator is an r.f. pentode with capacity coupling between its cathode and the screen grid of the first detector. The variable-selectivity filter is of the impedance-matching type, the controllable band-width range with the crystal being 14-to-1 (2800 to 200 cycles) at 10 times resonance input. The i.f. band-width without the crystal is given as 20 kc. at 1000 times resonance input. The filter switch is operated by the phasing control which provides adjustable anti-resonance for rejection of an undesired signal.

The second i.f. stage is transformer-coupled to one diode plate of the B7 second detector which also furnishes a.v.c. voltage for controlling the gain of the two r.f. and first i.f. stages. The "S-Meter" indicates signal strength with a.v.c. The other diode plate is stray coupled for auto-



ACR—136

matic overload protection with the a.v.c. switch in the "off" position. The c.w. oscillator, which has a panel control for beat-note adjustment, is capacity-coupled to the detector diode plate and the audio output of the B7 pentode section is resistance-coupled to the power stage. Headset output is taken from the B7 plate circuit through a jack, and speaker output from the power amplifier plate circuit for which a 7000-ohm load is specified.

## RCA ACR-136

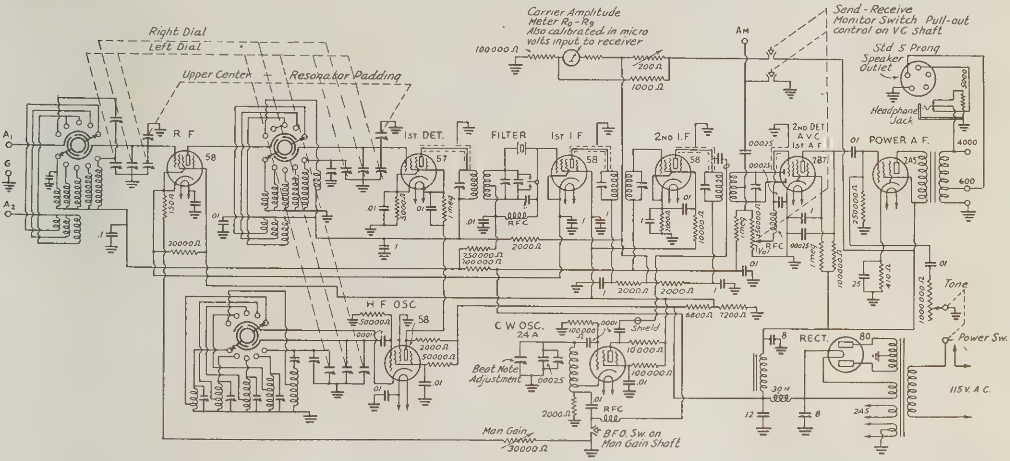
EMPLOYING five tubes in its receiver circuit proper and an additional rectifier in the self-contained power pack, the ACR-136 line-up is a stage of tuned r.f. amplification, a combined first detector and oscillator, one 460-kc. i.f. stage, a separate electron-coupled c.w. beat oscillator, a combined second detector, a.v.c. rectifier and first audio, and a pentode power output stage. Coil switching selects any one of the main tuning ranges 540 to 1720 kc., 1720 to 5400 kc., and 5400 to 18,000 kc. The last two include the 1.75-, 3.5-, 7- and 14-mc. amateur bands. Coils of the next-lower frequency range are automatically shorted on the higher ranges to prevent dead spots. A visual band indicator operates in conjunction with the switch, letters corresponding with the band-switch positions appearing in sequence through an opening in the illuminated main tuning-scale dial.

A single three-gang condenser is used in the tuning system and is driven through a two-speed reduction gearing giving a ratio of 10-to-1 with the operating knob pushed inward and a ratio of 50-to-1 with the knob pulled outward. The band-spreading method is of the mechanical type. Two concentric dial indicators are used, one being double-ended and indicating on the main 180-degree scales which are calibrated directly in frequencies and in units from 1 to 9, while the other traverses a 360-degree scale calibrated in 100 divisions, the latter being the vernier index. Approximate average calibration-spread figures for the vernier index scale are 1.4 kc. per division on the 1.75-mc. amateur band (2 revolutions of pointer), 6.7 kc. per division on 3.5 mc., 8.5 kc. per division on 7 mc., and 20 kc. per division on 14 mc. Approximate average tuning rate figures for the amateur bands with the 50-to-1 drive ratio are 47 kc. per knob rotation on 1.75 kc., 222 kc. per knob rotation on 3.5 kc., 300 kc. per knob rotation on 7 mc., and 650 kc. per knob rotation on 14 mc.

Following the i.f. stage, the 6B7 operates as a combined diode second detector, a.v.c. rectifier and pentode first audio amplifier. Audio input to the pentode section is taken from the volume control resistor in the load circuit of one diode plate, and a.v.c. voltage is taken from the same circuit through resistance-capacitance filtering networks, full a.v.c. being applied to the r.f. stage and reduced a.v.c. to the first detector and i.f. stages by tapping in at different points in the diode load resistance circuit, as shown in the diagram. A double-pole switch shorts the grid returns to ground to cut off a.v.c. action for reception with manual gain control, which is provided by the variable resistor in the cathode circuit of the r.f. and i.f. stages. This manual control is also operative with a.v.c.

The second diode plate is capacity-coupled to the plate of the beat oscillator. The operating beat-frequency adjustment is reached by lifting the lid of the receiver case. The plate circuit of the power stage is coupled to the 4-ohm speaker voice coil by a step-down transformer, the speaker being mounted within the case behind a grilled opening in the front panel.

# RME 9-D



RME–9D

DESIGNED for amateur and general communications use, the RME 9-D made by Radio Mfg. Engineers is a Single-Signal (crystal filter) type superhet employing 9 tubes including the rectifier of its self-contained power pack. The circuit sequence is a tuned r.f. stage, a screen-grid first detector and separate electron-coupled h.f. oscillator, variable band-width crystal filter, two transformer-coupled i.f. stages, a combined second detector, a.v.c. rectifier and pentode first audio, an electron-coupled c.w. beat oscillator coupled to the plate of the second i.f., and a pentode power audio amplifier.

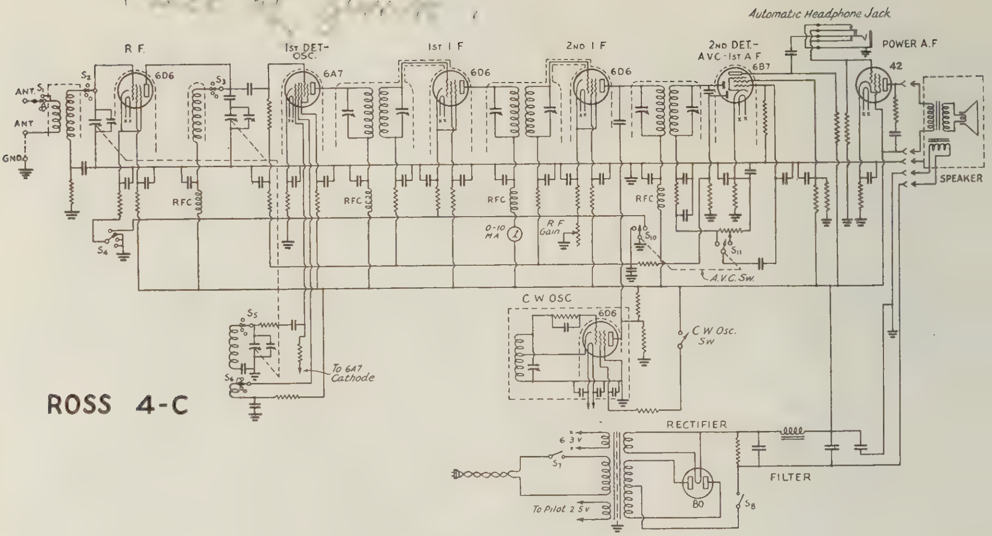
The tuning system is of the coil-switching type with separate condenser gangs for continuous-range and band-spread tuning, each controlled through a wedge-drive reduction gearing. The main ranges are 550 to 1500 kc., 1400 to 3100 kc., 3000 to 6800 kc., 6000 to 13,000 kc., and 12,000 to 23,000 kc. A trimmer control is provided for resonating the r.f. and first detector circuits on the higher frequencies.

The three-gang condenser of the band-spread unit is of the dual type, separate condenser sections providing different capacitance ranges for low- and high-frequency bands. Average calibration-spread figures are given as 2 kc. per dial division on the 1.75-mc. amateur band, 4 kc. per division on 3.5 mc., 6.5 kc. per division on 7 mc., and 10 kc. per division on 14 mc. Frequency tuning rates for the amateur bands are in similar proportion, actual values being determined by the knob-to-dial ratio which is not specified. Selectivity of the 465-kc. i.f. amplifier without the crystal filter is described as 18-kc. band-width at 1000 times resonance input and 35-kc. band-width at 10,000 times resonance input. "Effective" band-width of 50 cycles or less is specified with crystal. A signal-frequency to image response ratio of the order of 200-to-1 at 15 mc. is also given.

Following the i.f. amplifier, full-wave diode detection with a.v.c. for modulated signal reception is operative with the c.w. beat oscillator switch open, manual gain control coming into action for c.w. when this switch is closed. With the "send-receive" switch in the open position, the input stages are disabled by removal of their plate voltage and the monitor circuit becomes operative. This monitor circuit, which serves for 'phone or (with the beat oscillator) for c.w., utilizes the diode circuit of the second detector with untuned input from a pick-up antenna connected to the terminal "AM," the detector output being amplified by the audio stages with the normal audio volume control effective. With the send-receive switch closed, the monitor input is grounded and normal receiver action restored, including the carrier amplitude indication. This feature is supplied by a meter connected in a resistance network in the plate circuit of the i.f. amplifier and actuated by variations in plate current with change in bias on these tubes, thereby indicating variation in signal strength. The meter scale is calibrated both in arbitrary audibility (R) units and in receiver input voltage, 100$\mu$v. being equivalent to the full reading of 9 on the R scale.

In addition to the telephone jack, output transformer terminals for 4000-ohm speaker and 600-ohm line connections are available in the standard speaker outlet socket.

Piece of Junk!



## Ross 4-C

IMPROVED successor of the earlier "Jupiter" model, the Ross 4-C utilizes a total of 8 tubes, one being the rectifier in the self-contained power pack. As shown in the diagram, the circuit line-up is one stage of tuned r.f. pre-selection, a combination oscillator and first detector using a pentagrid, two 456-kc. i.f. stages, a diode-pentode as combined second detector, a.v.c. rectifier and first audio, an electron-coupled c.w. beat oscillator, and a power pentode output stage. The continuous frequency spectrum 550 to 20,000 kc. is covered in four main steps by the coil-switching tuning system in which separate three-gang condenser units with individual dials are employed for the main ranges and for electrical band-spreading.

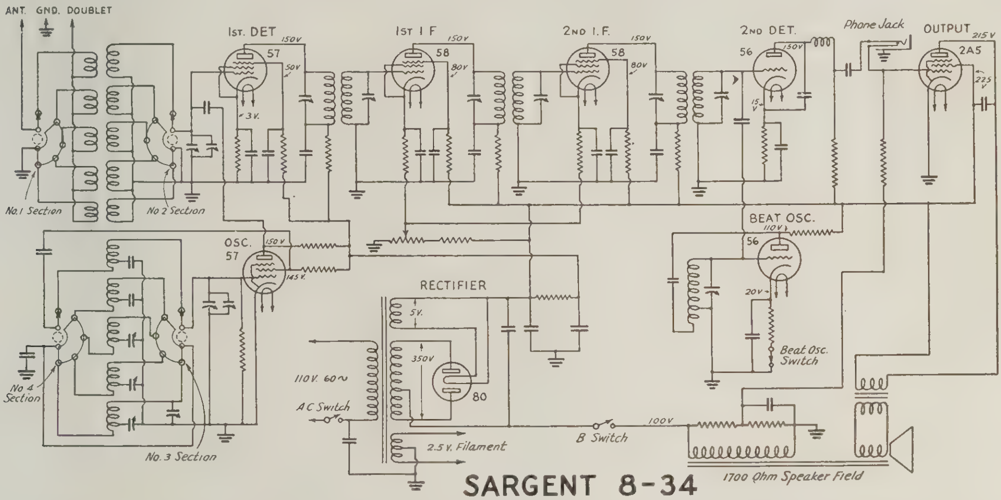
Calibration spread for the amateur bands is specified as 8.5 kc. per dial division on 14 mc., 7.3 kc. per division on 7 mc., and 1.6 kc. per division on the 3.9–4.0-mc. 'phone band. The 3.5- to 3.9-mc. c.w. band and the 1.75-mc. band are covered on the main tuning condenser, with proportionately greater band-spreading in slices by the auxiliary control. Tuning rates, with the auxiliary knob tuning nearly 1.7 times for 100 scale divisions, are approximately 500 kc. per knob rotation on 14 mc., 425 kc. per rotation on 7 mc., and 100 kc. per rotation on 3.9 mc.

The c.w. beat oscillator is completely shielded and is coupled to the plate of the second i.f. amplifier, feeding the second detector through the last i.f. transformer. One diode plate of the 6B7 serves for audio detection while the other, capacity coupled to the i.f. input circuit, provides a.v.c. voltage to the first detector and both i.f. stages. A.v.c. is removed for c.w. reception by grounding through one section of the switch indicated in the diagram, the other section of which shifts the audio tap on the detector diode load resistor. Manual gain control by means of the variable cathode resistor is applied to both i.f. stages on the high-frequency tuning ranges and to the first r.f. as well on the broadcast band (switch S4). A d.c. milliammeter in the plate feed circuit of the first i.f. stage serves as a tuning meter and indicator of relative carrier strength.

Headset output is taken from the plate circuit of the pentode section of the 6B7, which operates as the first audio stage, the telephone jack automatically connecting the 'phones between the interstage coupling condenser and ground. The separate speaker unit, enclosed in a matching cabinet, is connected by a standard-type plug and socket to the power pentode plate circuit and also to the power pack for which the speaker field coil serves as the second filter choke.

## Sargent 8-34

THE schematic diagram of the Sargent 8-34 shown is for the "Marine" model which incorporates a tuning range covering frequencies between 200 and 540 kc. (coils "E" and "K") in addition to the normal 540- to 20,000-kc. continuous range covered by the otherwise identical "Standard" model. Seven tubes are used in th superhet circuit and one in the self-containe power pack, the line-up being first detector an separate electron-coupled h.f. oscillator, tw 465-kc. i.f. stages, triode second detector, separate c.w. beat oscillator and pentode powe amplifier. The tuning is in four steps for the 540- to 20,000-kc. "Standard" range and in five for the "Marine" range. Coils of the self-contained assembly are selected by a four-pole gang-switch which has an extra section to short out completely all coils except those actually in circuit, thus preventing "dead-spotting."



SARGENT 8-34

The main tuning dial operates the rotors of the double-gang tuning condenser while the band-spread dial swivels the stators through a small range by operation of a special mechanical link arrangement. Reduction drives are used for both main and band-spread tuning controls, each of which has its own calibration scale. The design is especially intended for amateur-band reception, although figures on the calibration spread and frequency tuning rate are not specified. An antenna-trimmer control is provided for precise alignment of the signal input circuit over each amateur band.

Individual de-coupling of return and supply circuits is employed to insure circuit isolation, along with individual shielding in r.f. and i.f. circuits in addition to the shielding enclosure of the metal case. Speaker output is taken from the power stage by a separate dynamic speaker which is furnished with the a.c. operated models. Headset output is taken from the jack in the plate circuit of the second detector. Models for operation on 110- and 220-volt d.c. supply, as well as for 6-volt and 3-volt battery operation, are also available in corresponding circuit design, permanent-magnet type dynamics being used with the latter.

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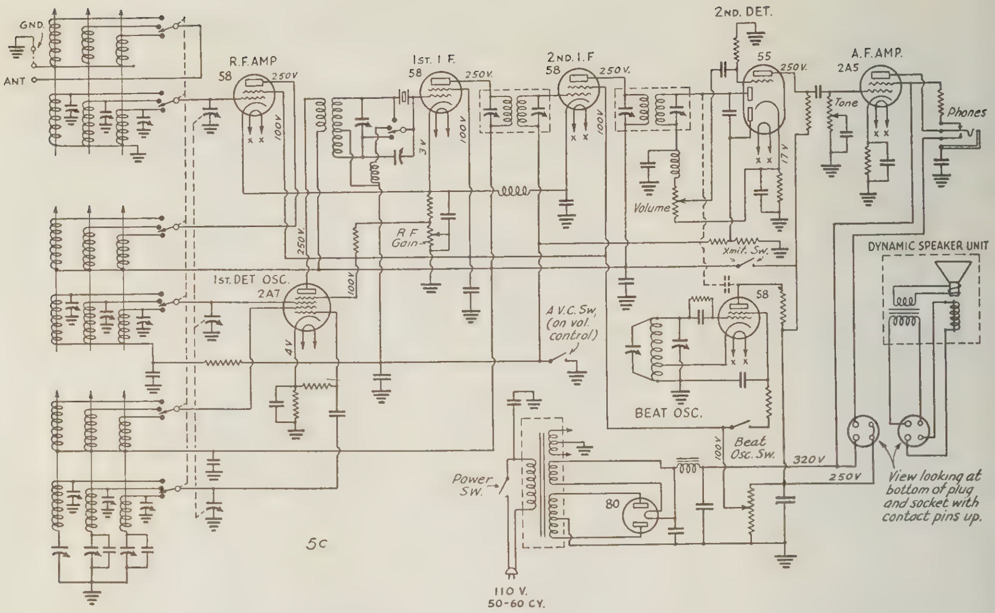
## The Silver 5C

McMURDO Silver's 5C Single-Signal type receiver has 7 tubes exclusive of the rectifier in the power pack which is on the same chassis. The tuning system is of the coil-switching type with three tuning ranges covering continuously the frequencies between 1500 and 23,000 kc. Band-spread tuning is accomplished by an auxiliary 3-gang condenser on the main unit, the auxiliary coming into action when the main tuning knob is pulled outward. An auxiliary tuning scale indicator of the watch-type dial is also brought into action in the band-spread position of this knob. The calibration spread for the amateur bands is specified as 200 degrees for 1.75 mc., 100 degrees for 3.5 and 7 mc., and 50 degrees for 14 mc. The mechanical ratio of the driving mechanism being 9 to 1, the tuning rates are approximately 60 kc. per knob rotation on 1.75 mc., 200 kc. per knob rotation on 3.5 mc., 120 kc. per knob rotation on 7 mc., and 320 kc. per knob rotation on 14 mc.

As shown in the diagram, a stage of tuned r.f. pre-selection precedes the frequency converter, which uses a 2A7 as combined h.f. oscillator and first detector. The variable band-width crystal filter unit couples the first detector output to the 465-kc. two-stage air-condenser tuned amplifier, the filter circuit being equipped with a switch to connect the crystal in series, in parallel, or off for straight superhet selectivity. The selectivity figure given is 26-kc. band-width at 10,000 times resonance input without the crystal, and 50-kc. effective band-width at an unspecified input ratio with the crystal. Diode detection, first-stage audio amplification and a.v.c. are accomplished in the 55 second detector, the audio output of which is resistance coupled to the 2A5 power stage. The c.w. beat oscillator is of the electron-



coupled type, capacity-coupled to the detector diode plate. Reduced headphone output is taken from the jack in the 2A5 plate circuit, the speaker being automatically disconnected when the 'phone plug is inserted.

Panel controls are provided for both audio volume and r.f. gain, operation of the audio control switching in the a.v.c. and the r.f. control being used to govern output level when the a.v.c. is switched off. Other panel controls include selectivity (on the crystal filter), send-receive switch for disabling the set during transmission, band-change (on the coil switch), tone, primary power and c.w. beat oscillator switches. A matching Jensen dynamic speaker unit is furnished with the receiver.

K – but I like the old system also!

## About Band-Spread

BACK in the "good old days," when signals were broad and receiver selectivity was inversely proportional, we got into the habit of describing such band-spreading as our tuning systems had simply in terms of how much dial space an amateur band occupied—"spreads the 80-meter band over 60 degrees," or "40 takes up half the dial," became typical forms of description. But do specifications such as these really give a sufficient description of a modern receiver's band-spread? Do they tell us anything at all about how critical a highly selective Single-Signal receiver may be in tuning adjustment? Our experience tells us that the answer to both questions is, "No."

As a matter of fact, simple specification of dial space per band is only a description of *calibration spread.* To get the whole story we must know also how fast we cover the kilocycles with motion of the tuning knob, for it is on the latter that the criticalness of tuning depends. What's the use of having a dial calibration readable to a kilocycle when the manual adjustment is so coarse as to require three or four swings back and forth to put the tuning hit-or-miss on the peak of a signal? We also must have an idea of the *manual tuning rate.*

Therefore, in describing the band-spreading of amateur receivers it is suggested that the *calibration spread* be given for each amateur band in terms of the average number of kilocycles (or cycles) per dial division; and that the *tuning rate* for each band be given in terms of the average number of kilocycles per tuning knob rotation.

NOW HURRY BACK AND GET MY WIFE!
P.F.D. 2

Hi!

# Looking Over the Circuits of the New Amateur-Band Superhets

## Salient Technical Features of the Latest Manufactured Models

By James J. Lamb*

ONCE upon a time the simple statement, "It's a superhet," was sufficient to give us a pretty good picture of the innards of any one of the few receivers of that type that were then available. The circuit used (there was practically only one) embodied a first detector, a high-frequency oscillator, a couple of i.f. amplifier stages, a second detector with c.w. beat oscillator, and an audio amplifier. There was little variety in the way these essentials were strung together. But now the picture is changed. Where there were but a few models there are now many; and where there was but one "standard" circuit arrangement there is now a variety of essentially different combinations. With designers exercising their individual choice in diversified use of multi-purpose tubes, different methods of obtaining band-spread, i.f. stages ranging from one to four, several types of automatic gain control, a variety of i.f. filters, multiform band-changing devices, and then compounding the complication by adding original kinks of their own—well, with all this going on, most of us are hard put to remember how many tubes the Whatzit has, let alone to be familiar with what all the different circuits look like.

To summarize in one piece as much of this essential information as is possible, and thus do part of our job of keeping the gang abreast of the present state of the art, is the object of this article. Supplementing the circuit diagrams, salient technical features of the receivers will be sketched, taking the models in alphabetical sequence by manufacturer's name.

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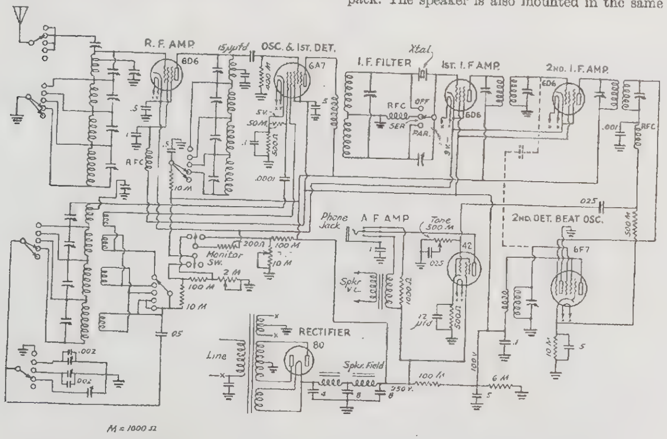
* Technical Editor QST.

## Hallicrafter's Super-Skyrider

THE Super-Skyrider is of the Single-Signal type, having six tubes of the 6-volt variety in the circuit of the receiver proper in addition to the rectifier of the self-contained power pack. The speaker is also mounted in the same



cabinet, behind a screened opening in the panel. As shown in the diagram, the circuit line-up proceeds through one stage of tuned r.f. pre-selection tuned-impedance coupled to the combined oscillator and first detector, a crystal filter of the fixed band-width type, two i.f. stages using transformer coupling with air-condenser tuning, a combined second detector and c.w. beat oscillator, and pentode power output stage.

The tuning system is of the switching type having sectionalized coils and using a six-gang switch, one section being used exclusively for the oscillator padding condensers and the three for the main coils providing shorting of adjacent sections to minimize dead spots. Band spreading, both in calibration and tuning rate, is accomplished by mechanical and electrical methods in combination, an auxiliary gang condenser being used in parallel with the main gang and having its own calibration dial and reduction drive. Approximate band-spread figures[1] for the amateur bands are as follows:

1.75 mc. (in nearly 3 sweeps of band-spread range), calibration spread 1 kc. per scale division, tuning rate 25 kc. per knob rotation; 3.5 mc. (in 2.6 sweeps of band-spread range), calibration spread 2 kc. per division, tuning rate 60 kc. per knob rotation; 7 mc., calibration spread 4.5 kc. per division, tuning rate 130 kc. per knob rotation; 14 mc., calibration spread 8 kc. per division, tuning rate 240 kc. per knob rotation.

The crystal filter, which is switched in by a panel control for single-signal reception, is of the fixed band-width type with the phasing condenser variable from the front as an operating adjustment for rejecting an undesired interfering signal. The "transmit-receive" switch, when thrown to the "transmit" position, simultaneously disables the r.f. stage and changes the bias on the i.f. tubes to a sensitivity level suitable for monitoring the station's own transmitter. Additional panel adjustments are the combined power switch and tone control, beat oscillator and wave-change switches, and r.f. gain (volume) control. The beat oscillator frequency and monitor level adjustments are at the rear. The c.w. beat oscillator utilizes the screen-grid section of the 6F7 connected as a triode, the grid and cathode of the triode section being used as the diode second detector (with the triode plate grounded so as to be ineffective). The beat oscillator is capacity coupled to the grid of the second i.f. stage.

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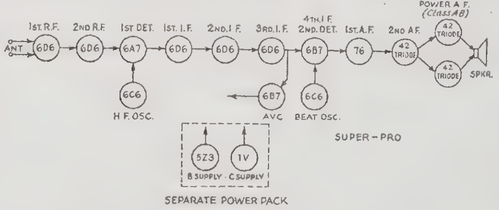
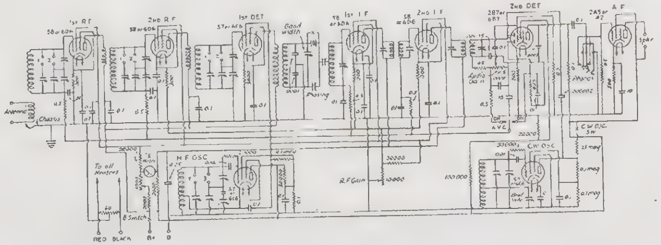
[1] For explanation of the description of band-spread figures, see the note on band spreading elsewhere in this issue.

## Hammarlund Super-Pro

HAMMARLUND'S new amateur type Super-Pro, scheduled for release in the near future, uses 14 tubes in the receiver circuit proper with 2 more as rectifiers in a separate plate- and bias-voltage power pack. A block diagram of the tube line-up is shown, the complete schematic not being available at the time of this writing. The circuit sequence starts with two stages of tuned r.f. pre-selection, followed by a pentagrid first detector with separate electron-coupled high-frequency oscillator, three stages of 465-kc. i.f. amplification with variable band-width air-condenser tuned transformers, and a pentode-diode type second detector which also furnishes a fourth stage of i.f. A second tube of this type serves exclusively for amplified a.v.c. which is not affected by the output of the electron-coupled beat oscillator and therefore can be used for c.w. as well as for 'phone reception. The diode detector is followed by a resistance-coupled stage of audio voltage amplification, a power driver stage and a push-pull power output stage operating Class AB. Both power stages use pentode tubes connected as triodes.



The tuning system is of the coil-switching type, the switch mechanism being a special slotted-cam operated design providing shorting of all coils except those actually in circuit. Five tuning ranges between 540 kc. and 22 mc. are covered in 2-to-1 steps by the main tuning condenser gang. Band-spread tuning is accomplished by an auxiliary gang which has an individual calibration scale and which is automatically cut in parallel



HRO

with the main gang by the coil switch on the three high-frequency ranges (above 2.5 mc.). Amateur band-spread data are given as follows:

3.5 to 4.0 mc., calibration spread 5 kc. per scale division, tuning rate 80 kc. per knob rotation; 7.0 to 7.3 mc., calibration spread 4 kc. per scale division, tuning rate 60 kc. per knob rotation; 14.0 to 14.4 mc., calibration spread 5 kc. per scale division, tuning rate 80 kc. per knob rotation. The three high-frequency bands come at the same tuning capacitance value, making it unnecessary to reset the main tuning condenser when switching from one to another.

Panel equipment includes a tuning meter and controls additional to the usual are provided for c.w. beat-note adjustment and ganged adjustment of the coupling of the i.f. transformers to vary band-width. The band-width range[2] of values obtained is given as from 2 to 7 kc. at 2X resonant input voltage, from 4.5 to 10 kc. at 10X and from 14 to 24 kc. at 10,000X. Resonance frequency (or tuning) is unaffected by variation of selectivity.

Best of the bunch

## National HRO

Yours [illegible]

AS SHOWN in the diagram, the National HRO circuit contains 9 tubes, exclusive of the rectifier in its separate power pack. There are two stages of tuned r.f. pre-selection, pentode first detector and separate oscillator, variable band-width crystal filter, two 456-kc. i.f. stages, combination diode second detector and a.v.c. with pentode first audio stage, electron-coupled c.w. oscillator, and pentode power output amplifier. The tuning system utilizes four-gang plug-in assemblies, each containing aligning and tracking condensers individually pre-set for optional continuous-range or amateur band-spread tuning. The change from one method to the other is accomplished by shifting connecting screws. All tuning and adjustment condensers in h.f. and i.f. circuits are air-dielectric type. The normal tuning range is from 1.7 to 30.0 mc. in four steps, each of slightly more than 2-to-1 tuning ratio, coil assemblies for two additional steps extending the range down to 500 kc.

The four-gang tuning condenser is driven through a worm-type reduction gearing giving 10 knob rotations for 180-degree turning of the condensers. The calibration dial has an internal epicyclic geared scale reading in steps of 10 between 0 and 500. With the 50 scale markings on the main dial, calibration is direct reading to 1 part in 500. With the band-spread coil connections each amateur band is given a span of 400 divisions, making the calibration spread approximately 700 cycles per division on 1.75 mc., 1250 cycles on 3.5 mc., 650 cycles on 7 mc., and 1000 cycles on 14 mc. The corresponding tuning rates are 33 kc. per manual knob rotation on 1.75 mc., 56 kc. per rotation on 3.5 mc., 35 kc. per rotation on 7 mc., and 45 kc. per rotation on 14 mc.

The high-frequency oscillator is an r.f. pentode with capacity coupling between its cathode and the screen grid of the first detector. The variable-selectivity filter is of the impedance-matching type, the controllable band-width range with the crystal being 14-to-1 (2800 to 200 cycles) at 10 times resonance input. The i.f. band-width without the crystal is given as 20 kc. at 1000 times resonance input. The filter switch is operated by the phasing control which provides adjustable anti-resonance for rejection of an undesired signal.

The second i.f. stage is transformer-coupled to one diode plate of the B7 second detector which also furnishes a.v.c. voltage for controlling the gain of the two r.f. and first i.f. stages. The "S-Meter" indicates signal strength with a.v.c. The other diode plate is stray coupled for automatic overload protection with the a.v.c. switch in the "off" position. The c.w. oscillator, which has a panel control for beat-note adjustment, is capacity-coupled to the detector diode plate and the audio output of the B7 pentode section is resistance-coupled to the power stage. Headset output is taken from the B7 plate circuit through a jack, and speaker output from the power amplifier plate circuit for which a 7000-ohm load is specified.

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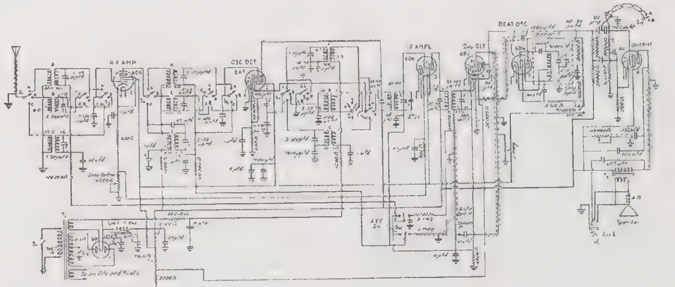
[2] The method of describing selectivity in terms of band-width is explained in the article, "Receiver Selectivity Characteristics," in this same issue.



ACR-136

## RCA ACR-136

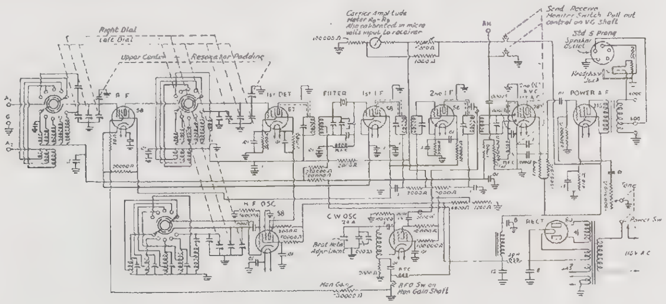
EMPLOYING five tubes in its receiver circuit proper and an additional rectifier in the self-contained power pack, the ACR-136 line-up is a stage of tuned r.f. amplification, a combined first detector and oscillator, one 460-kc. i.f. stage, a separate electron-coupled c.w. beat oscillator, a combined second detector, a.v.c. rectifier and first audio, and a pentode power output stage. Coil switching selects any one of the main tuning ranges 540 to 1720 kc., 1720 to 5400 kc., and 5400 to 18,000 kc. The last two include the 1.75-, 3.5-, 7- and 14-mc. amateur bands. Coils of the next-lower frequency range are automatically shorted on the higher ranges to prevent dead spots. A visual band indicator operates in conjunction with the switch, letters corresponding with the band-switch positions appearing in sequence through an opening in the illuminated main tuning-scale dial.

A single three-gang condenser is used in the tuning system and is driven through a two-speed reduction gearing giving a ratio of 10-to-1 with the operating knob pushed inward and a ratio of 50-to-1 with the knob pulled outward. The band-spreading method is of the mechanical type. Two concentric dial indicators are used, one being double-ended and indicating on the main 180-degree scales which are calibrated directly in frequencies and in units from 1 to 9, while the other traverses a 360-degree scale calibrated in 100 divisions, the latter being the vernier index. Approximate average calibration-spread figures for the vernier index scale are 1.4 kc. per division on the 1.75-mc. amateur band (2 revolutions of pointer), 6.7 kc. per division on 3.5 mc., 8.5 kc. per division on 7 mc., and 20 kc. per division on 14 mc. Approximate average tuning rate figures for the amateur bands with the 50-to-1 drive ratio are 47 kc. per knob rotation on 1.75 kc., 222 kc. per knob rotation on 3.5 kc., 300 kc. per knob rotation on 7 mc., and 650 kc. per knob rotation on 14 mc.

Following the i.f. stage, the 6B7 operates as a combined diode second detector, a.v.c. rectifier and pentode first audio amplifier. Audio input to the pentode section is taken from the volume control resistor in the load circuit of one diode plate, and a.v.c. voltage is taken from the same circuit through resistance-capacitance filtering networks, full a.v.c. being applied to the r.f. stage and reduced a.v.c. to the first detector and i.f. stages by tapping in at different points in the diode load resistance circuit, as shown in the diagram. A double-pole switch shorts the grid returns to ground to cut off a.v.c. action for reception with manual gain control, which is provided by the variable resistor in the cathode circuit of the r.f. and i.f. stages. This manual control is also operative with a.v.c.

The second diode plate is capacity-coupled to the plate of the beat oscillator. The operating beat-frequency adjustment is reached by lifting the lid of the receiver case. The plate circuit of the power stage is coupled to the 4-ohm speaker voice coil by a step-down transformer, the speaker being mounted within the case behind a grilled opening in the front panel.

## RME 9-D



RME–9D

DESIGNED for amateur and general communications use, the RME 9-D made by Radio Mfg. Engineers is a Single-Signal (crystal filter) type superhet employing 9 tubes including the rectifier of its self-contained power pack. The circuit sequence is a tuned r.f. stage, a screen-grid first detector and separate electron-coupled h.f. oscillator, variable band-width crystal filter, two transformer-coupled i.f. stages, a combined second detector, a.v.c. rectifier and pentode first audio, an electron-coupled c.w. beat oscillator coupled to the plate of the second i.f., and a pentode power audio amplifier.

The tuning system is of the coil-switching type with separate condenser gangs for continuous-range and band-spread tuning, each controlled through a wedge-drive reduction gearing. The main ranges are 550 to 1500 kc., 1400 to 3100 kc., 3000 to 6800 kc., 6000 to 13,000 kc., and 12,000 to 23,000 kc. A trimmer control is provided for resonating the r.f. and first detector circuits on the higher frequencies.

The three-gang condenser of the band-spread unit is of the dual type, separate condenser sections providing different capacitance ranges for low- and high-frequency bands. Average calibration-spread figures are given as 2 kc. per dial division on the 1.75-mc. amateur band, 4 kc. per division on 3.5 mc., 6.5 kc. per division on 7 mc., and 10 kc. per division on 14 mc. Frequency tuning rates for the amateur bands are in similar proportion, actual values being determined by the knob-to-dial ratio which is not specified. Selectivity of the 465-kc. i.f. amplifier without the crystal filter is described as 18-kc. band-width at 1000 times resonance input and 35-kc. band-width at 10,000 times resonance input. "Effective" band-width of 50 cycles or less is specified with crystal. A signal-frequency to image response ratio of the order of 200-to-1 at 15 mc. is also given.

Following the i.f. amplifier, full-wave diode detection with a.v.c. for modulated signal reception is operative with the c.w. beat oscillator switch open, manual gain control coming into action for c.w. when this switch is closed. With the "send-receive" switch in the open position, the input stages are disabled by removal of their plate voltage and the monitor circuit becomes operative. This monitor circuit, which serves for 'phone or (with the beat oscillator) for c.w., utilizes the diode circuit of the second detector with untuned input from a pick-up antenna connected to the terminal "AM," the detector output being amplified by the audio stages with the normal audio volume control effective. With the send-receive switch closed, the monitor input is grounded and normal receiver action restored, including the carrier amplitude indication. This feature is supplied by a meter connected in a resistance network in the plate circuit of the i.f. amplifier and actuated by variations in plate current with change in bias on these tubes, thereby indicating variation in signal strength. The meter scale is calibrated both in arbitrary audibility (R) units and in receiver input voltage, 100μv. being equivalent to the full reading of 9 on the R scale.

In addition to the telephone jack, output transformer terminals for 4000-ohm speaker and 600-ohm line connections are available in the standard speaker outlet socket.

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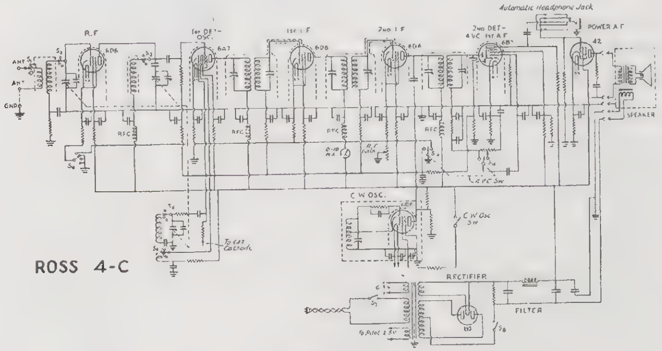


## Ross 4-C

IMPROVED successor of the earlier "Jupiter" model, the Ross 4-C utilizes a total of 8 tubes, one being the rectifier in the self-contained power pack. As shown in the diagram, the circuit line-up is one stage of tuned r.f. pre-selection, a combination oscillator and first detector using a pentagrid, two 456-kc. i.f. stages, a diode-pentode as combined second detector, a.v.c. rectifier and first audio, an electron-coupled c.w. beat oscillator, and a power pentode output stage. The continuous frequency spectrum 550 to 20,000 kc. is covered in four main steps by the coil-switching tuning system in which separate three-gang condenser units with individual dials are employed for the main ranges and for electrical band-spreading.

Calibration spread for the amateur bands is specified as 8.5 kc. per dial division on 14 mc., 7.3 kc. per division on 7 mc., and 1.6 kc. per division on the 3.9–4.0-mc. 'phone band. The 3.5- to 3.9-mc. c.w. band and the 1.75-mc. band are covered on the main tuning condenser, with proportionately greater band-spreading in slices by the auxiliary control. Tuning rates, with the auxiliary knob tuning nearly 1.7 times for 100 scale divisions, are approximately 500 kc. per knob rotation on 14 mc., 425 kc. per rotation on 7 mc., and 100 kc. per rotation on 3.9 mc.

The c.w. beat oscillator is completely shielded and is coupled to the plate of the second i.f. amplifier, feeding the second detector through the last i.f. transformer. One diode plate of the 6B7 serves for audio detection while the other, capacity coupled to the i.f. input circuit, provides a.v.c. voltage to the first detector and both i.f. stages. A.v.c. is removed for c.w. reception by grounding through one section of the switch indicated in the diagram, the other section of which shifts the audio tap on the detector diode load resistor. Manual gain control by means of the variable cathode resistor is applied to both i.f. stages on the high-frequency tuning ranges and to the first r.f. as well on the broadcast band (switch S4). A d.c. milliammeter in the plate feed circuit of the first i.f. stage serves as a tuning meter and indicator of relative carrier strength.

Headset output is taken from the plate circuit of the pentode section of the 6B7, which operates as the first audio stage, the telephone jack automatically connecting the 'phones between the interstage coupling condenser and ground. The separate speaker unit, enclosed in a matching cabinet, is connected by a standard-type plug and socket to the power pentode plate circuit and also to the power pack for which the speaker field coil serves as the second filter choke.

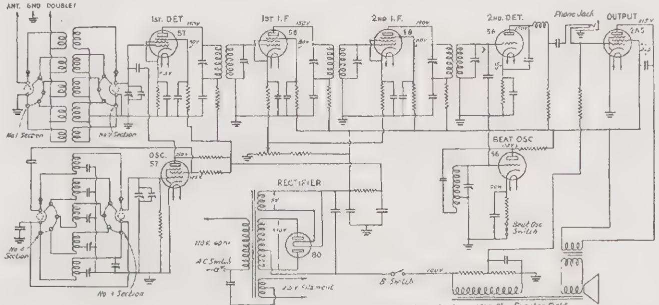
## Sargent 8-34

THE schematic diagram of the Sargent 8-34 shown is for the "Marine" model which incorporates a tuning range covering frequencies between 200 and 540 kc. (coils "E" and "K") in addition to the normal 540- to 20,000-kc. continuous range covered by the otherwise identical "Standard" model. Seven tubes are used in the superhet circuit and one in the self-contained power pack, the line-up being first detector and separate electron-coupled h.f. oscillator, two 465-kc. i.f. stages, triode second detector, separate c.w. beat oscillator and pentode power

amplifier. The tuning is in four steps for the 540- to 20,000-kc. "Standard" range and in five for the "Marine" range. Coils of the self-contained assembly are selected by a four-pole gang-switch which has an extra section to short out completely all coils except those actually in circuit, thus preventing "dead-spotting."

The main tuning dial operates the rotors of the double-gang tuning condenser while the band-spread dial swivels the stators through a small range by operation of a special mechanical link arrangement. Reduction drives are used for both main and band-spread tuning controls, each of which has its own calibration scale. The design is especially intended for amateur-band reception, although figures on the calibration spread and frequency tuning rate are not specified. An antenna-trimmer control is provided for precise alignment of the signal input circuit over each amateur band.

Individual de-coupling of return and supply circuits is employed to insure circuit isolation, along with individual shielding in r.f. and i.f. circuits in addition to the shielding enclosure of the metal case. Speaker output is taken from the power stage by a separate dynamic speaker which is furnished with the a.c. operated models. Headset output is taken from the jack in the plate circuit of the second detector. Models for operation on 110- and 220-volt d.c. supply, as well as for 6-volt and 3-volt battery operation, are also available in corresponding circuit design, permanent-magnet type dynamics being used with the latter.



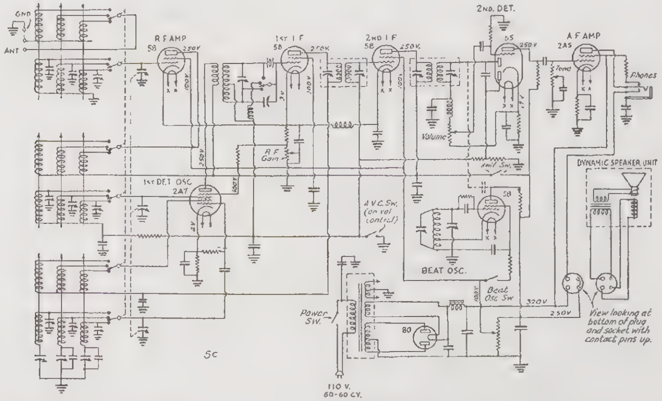
SARGENT 8-34

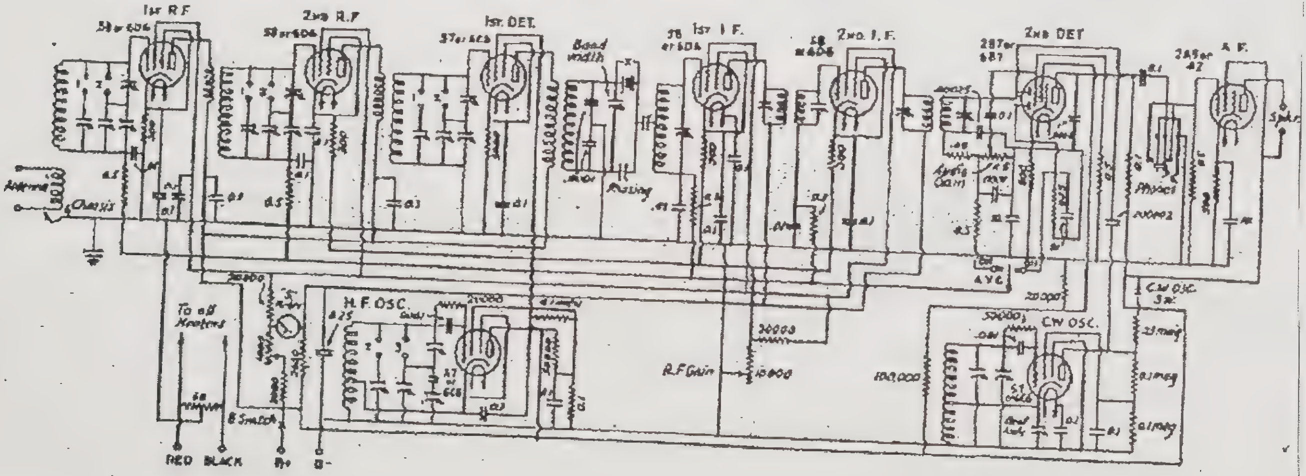
## The Silver 5C

McMURDO Silver's 5C Single-Signal type receiver has 7 tubes exclusive of the rectifier in the power pack which is on the same chassis. The tuning system is of the coil-switching type with three tuning ranges covering continuously the frequencies between 1500 and 23,000 kc. Band-spread tuning is accomplished by an auxiliary 3-gang condenser on the main unit, the auxiliary coming into action when the main tuning knob is pulled outward. An auxiliary tuning scale indicator of the watch-type dial is also brought into action in the band-spread position of this knob. The calibration spread for the amateur bands is specified as 200 degrees for 1.75 mc., 100 degrees for 3.5 and 7 mc., and 50 degrees for 14 mc. The mechanical ratio of the driving mechanism being 9 to 1, the tuning rates are approximately 60 kc. per knob rotation on 1.75 mc., 200 kc. per knob rotation on 3.5 mc., 120 kc. per knob rotation on 7 mc., and 320 kc. per knob rotation on 14 mc.

As shown in the diagram, a stage of tuned r.f. pre-selection precedes the frequency converter, which uses a 2A7 as combined h.f. oscillator and first detector. The variable band-width crystal filter unit couples the first detector output to the 465-kc. two-stage air-condenser tuned amplifier, the filter circuit being equipped with a switch to connect the crystal in series, in parallel, or off for straight superhet selectivity. The selectivity figure given is 26-kc. band-width at 10,000 times resonance input without the crystal, and 50-kc. effective band-width at an unspecified input ratio with the crystal. Diode detection, first-stage audio amplification and a.v.c. are accomplished in the 55 second detector, the audio output of which is resistance coupled to the 2A5 power stage. The c.w. beat oscillator is of the electron-coupled type, capacity-coupled to the detector diode plate. Reduced headphone output is taken from the jack in the 2A5 plate circuit, the speaker being automatically disconnected when the 'phone plug is inserted.

Panel controls are provided for both audio volume and r.f. gain, operation of the audio control switching in the a.v.c. and the r.f. control being used to govern output level when the a.v.c. is switched off. Other panel controls include selectivity (on the crystal filter), send-receive switch for disabling the set during transmission, band-change (on the coil switch), tone, primary power and c.w. beat oscillator switches. A matching Jensen dynamic speaker unit is furnished with the receiver.

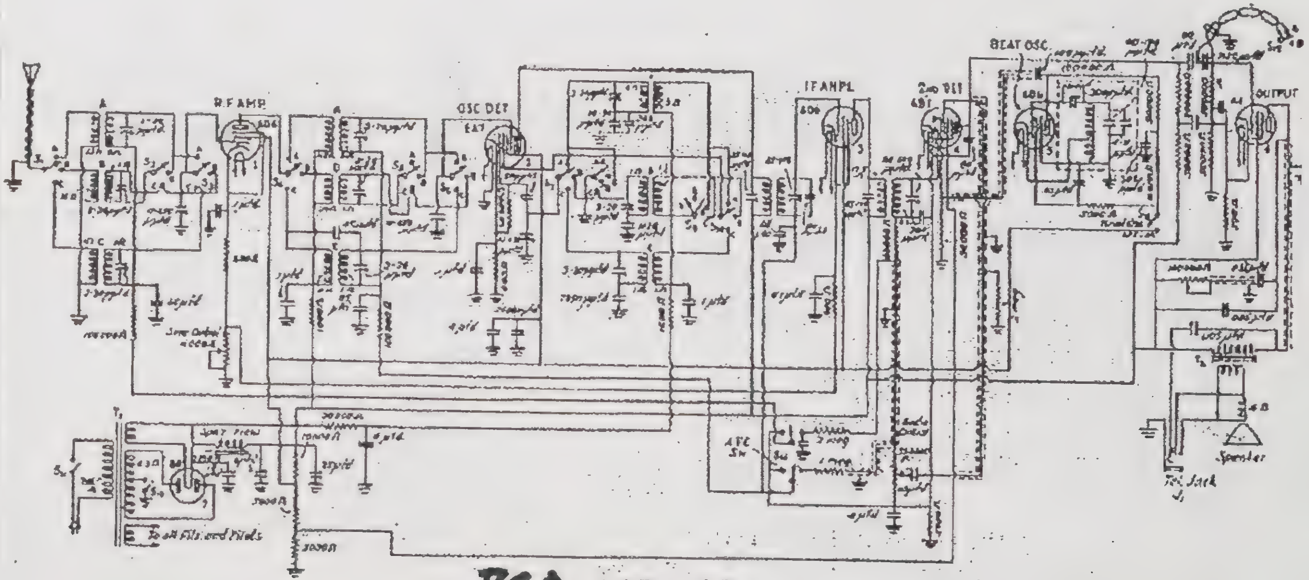



1st R.F
58 or 6D6
2nd R.F
58 or 6D6
1st. DET.
57 or 6C6
Band width
Phasing
58 or 6D6
1st I.F.
58 or 6D6
2nd. I.F.
2nd DET
2B7 or 6B7
2A5 or 42
A.F.
Spkr.
Antenna
Chassis
0.5
0.1
0.5
0.1
0.1
0.1
.01
Audio Gain
A.V.C.
Phonect
20000
To all Heaters
B Switch
RED
BLACK
B+
B-
H.F. OSC.
.025
57 or 6C6
21000
R.F. Gain
10000
20000
100,000
50000
C.W. OSC.
57 or 6C6
.25 meg
0.1 meg
0.1 meg
C.W. OSC. Sw.

HRO.

June 30th,

Ok this is it Kid, do you like it.??


R.F AMP
6D6
OSC DET
6A7
IF AMPL
6D6
2nd DET
6B7
BEAT OSC
6D6
OUTPUT
41
AVC Sw
Sens Control
T1
T2
S1
To all Fils and Pilots
Speaker
Tel Jack
J1

**RCA** ACR-136

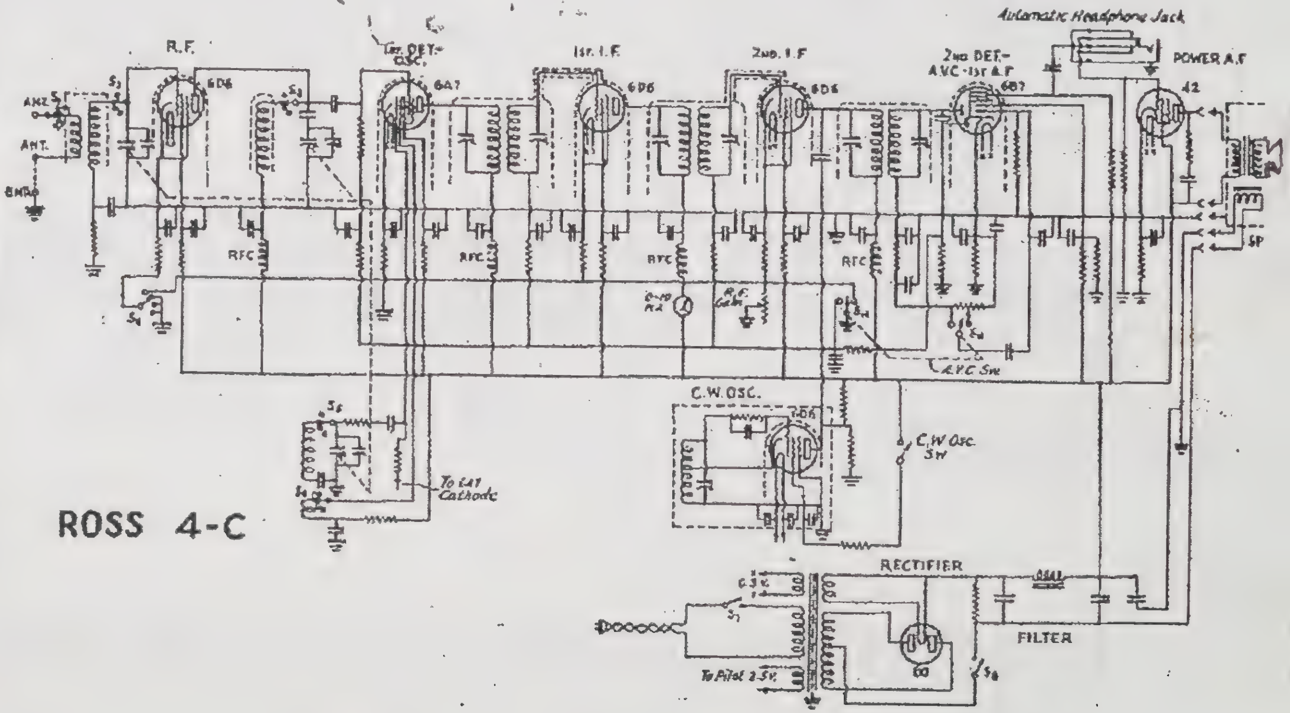
**John Travis**

**From:** John Travis <jtravis@buncombe.main.nc.us>
**To:** <dbjer1129@cs.com>
**Sent:** Sunday, June 25, 2000 4:12 PM
**Subject:** a message from Charles Coberly

I am a member of our local NAMI group here ....received a message from Mr. Coberly that you seek information...

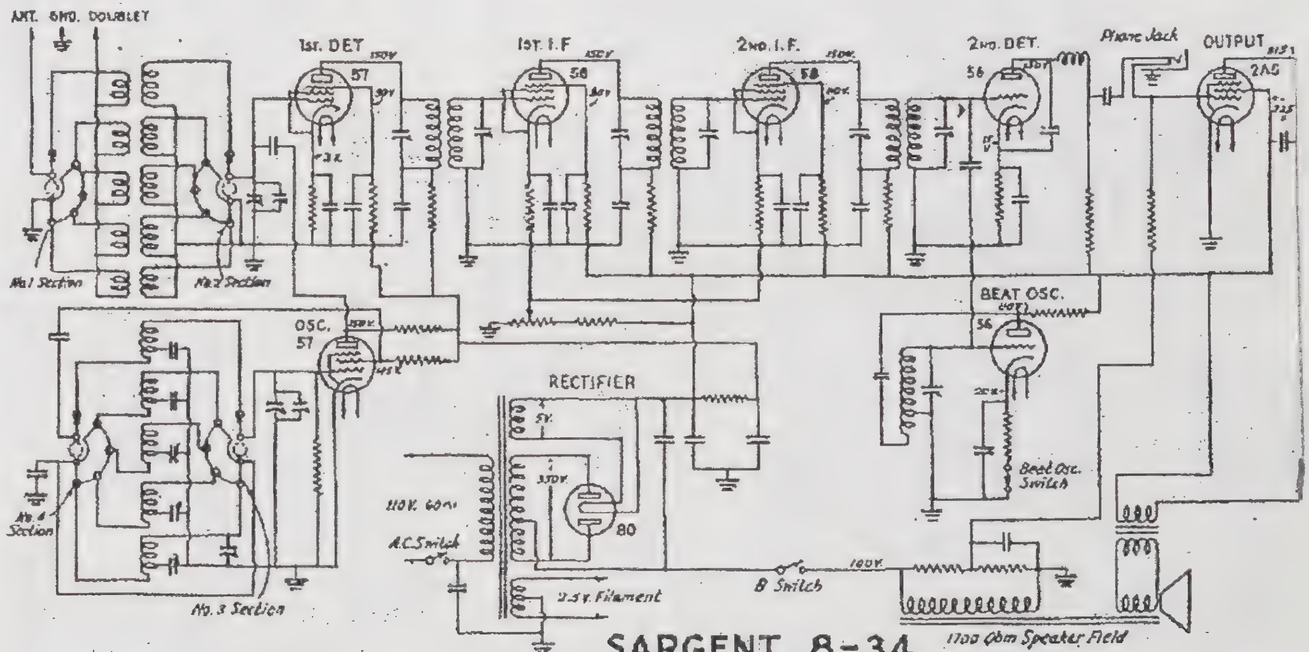
please give us a call and we can go from there....

John and Mary Lane Travis,
Asheville


R.F.
6D6
ANT.
ANT.
GND.
$S_1$
$S_2$
$S_3$
$S_4$
RFC
1st DET.-OSC.
6A7
1st I.F.
6D6
2nd. I.F.
6D6
0-10 MA
R.F. Gain
2nd DET.-A.V.C.-1st A.F.
6B7
A.V.C. Sw
Automatic Headphone Jack
POWER A.F.
42
SP
$S_5$
$S_6$
To 6A7 Cathode
C.W. OSC.
6D6
C.W. Osc. Sw
RECTIFIER
6.3 V.
$S_7$
To Pilot 2.5 V.
80
$S_8$
FILTER

# ROSS 4-C

| | | | | |
|---|---|---|---|---|
| Accardo, Nina | 7 Redbo Lane | Asheville | 28806 | 251-5052 |
| ACCESS.INC. | 231 S.Liberty St. | Asheville | 28801 | |
| Aiken, Mary | 45 Far Away Lane | Flat Rock | 28731 | 698-0299 |
| Allen, Toni | 1311 Hyman Ave. | Hendersonville | 28739 | 696-9068 |
| Allmond, Becky | 222 Glen Bridge Rd. D-32 | Arden | 28704 | 681-9886 |
| Anderson, Bob | 205-B Country Ridge Rd. | Hendersonville | 28739 | 697-0464 |
| Anderson, Dale | 36-D Sunset Drive | Asheville | 28804 | 251-1824 |
| Are, Martha | 225 S. French /Broad St. | Asheville | 28801 | |
| Ariail,Jerry & Linda | 174 Rhododendron Dr. | Arden | 28704 | 684-3838 |
| Arrowood, Carol | 7 W. Baird Mtn. Road | Asheville | 28804 | 298-2104 |
| Augusten, Dorothy | 215 Edgewood Road | Asheville | 28804 | 254-3490 |
| Ayers, Barbi | 1380 Highway 91 | Elizabethton,TN | 37643 | |
| Bagby, Monica | P.O. Box 18688 | Asheville | 28804 | |
| Bakaj,Joe | P.O. Box 1608 | Lake Junaluska | 28745 | |
| Ballew, Aletha | 105 Westwood Drive | Marion | 28752 | |
| Barnwell, Paula | 47 Bob Barnwell Rd | Fletcher | 28732 | |
| Barrow, Kay | P,O, Box 7408 | Asheville | 28802 | |
| Barry, Clare | 11 Lone Pine Rd. | Asheville | 28803 | |
| Bauknight, Diane | P.O. Box 665 | Arden | 28704 | 687-1130(W)628-2122(H) |
| Beachem, Bob & Dot | 12 Indian Mound Trail | Fairview | 28730 | 628-1512 |
| Beattie, Kathryn | 347 Dillingham Circle | Asheville | 28805 | 298-7786 |
| Becky Allmond | 222 Glenn Bridge Rd.D-32 | Arden | 28704 | |
| Bell, Donna L. | 117 Lower Christ Sch. Rd. | Fletcher | 28732 | 684-6295 |
| Bemis, Russ | 70 White Oak Road | Arden | 28704 | |
| Benefield,Marie & Jo | 204 Nova Road | Morganton | 28655 | 437-1078 |
| Benning,Mrs. Jack | 321 Pearson Drive | Asheville | 28801 | 253-5439 |
| Bent, Betsy | Mission-St.Joes | Asheville | 28801 | |
| Bernas, Ms. Gail | 7 Ector Street, Apt. 7H | Asheville | 28806 | |
| Berner, Mrs. Lynn | BRC, 356 Biltmore Ave. | Asheville | 28801 | 258-3500 |
| Betke, Janet | 9 Sunset View | Asheville | 28804 | |
| Bingham, Pastor Bill | 283 Merrimon Ave. | Asheville | 28801 | |
| Bissinger, Louise | 30 Fieldcrest Circle | Asheville | 28806 | 255-9806 258-9655 (O) |
| Blankenship, Randy & Becky | 10 White Pines Circle | Fletcher | 28732 | |
| Blaylock, Teresa | 9 Bradford Ct. | Candler | 28715 | |
| Bloomfield, Jennifer | PO Box 1793 | Arden | 28704 | |
| Bodford, Diana | Rt. 9, Box 84 | Burnsville | 28714 | |
| Boshart, Ruth | 35 Nebraska Ave. | Asheville | 28806 | 236-1233 |
| Brandon, Arlene & Kevin | 720A Old US 70 West | Black Mtn. | 28711 | 669-6834 |
| Branscombe, Jena | 66 Mountain St. #118 | Asheville | 28801 | 253-1023 |
| Brewer,Doris | 150 Wyoming Road | Asheville | 28803 | 258-9425 |
| Bridgers, Susan | P.O.Box 1336 | Leicester | 28748 | |
| Brooke, George | 128 Virginia Ave. | Asheville | 28806 | 252-6348 |
| Brown, Lewis & Peggy | 467 Tippett Branch Rd. | Franklin | 28734 | 369-5432 |
| Brummond, Bob & Kathy | 1004 New Haw Creek Rd. | Asheville | 28805 | 298-6222 |
| Buck, Michael & Debbie | 104 Dry Ridge Road | Asheville | 28804 | 253-1992 |
| Buckner, Kathleen | 131 Kyfields | Weaverville | 28787 | 645-2969 |
| Buckner, Susan | 9 Unaka Ave | Asheville | 28803 | 274-0644 |
| Buie, Dr. Stephen E. | PO Box 2035 | Asheville | 28802 | |
| Burch, Miriam & Virgil | 1331 Charlotte Highway | Fairview | 28730 | 628-1782 |
| Burns, Dr. Margaret | 311 Kimberly Ave. | Asheville | 28804 | 253-3398 |
| Campbell, Kathryn | 212 North Ave | Swannanoa | 28778 | 686-7566 |
| Carey, Nancy & Bob | 1091 Highway 80,South | Burnsville | 28714 | 675-5271 |
| Carpenter, Jerome | 54 Highland St. | Asheville | 28801 | |


ANT.
GND.
DOUBLET
No.1 Section
No.2 Section
1st. DET
57
150V
90V
1st. I.F
58
150V
90V
2nd. I.F.
58
150V
40K
2nd. DET.
56
Phone Jack
OUTPUT
2A5
315V
225
OSC.
57
45K
No.4 Section
No.3 Section
RECTIFIER
5V.
330V.
80
110V. 60~
A.C.Switch
2.5v. Filament
B Switch
100V.
BEAT OSC.
56
25K
Beat Osc. Switch
1700 Ohm Speaker Field

SARGENT 8-34

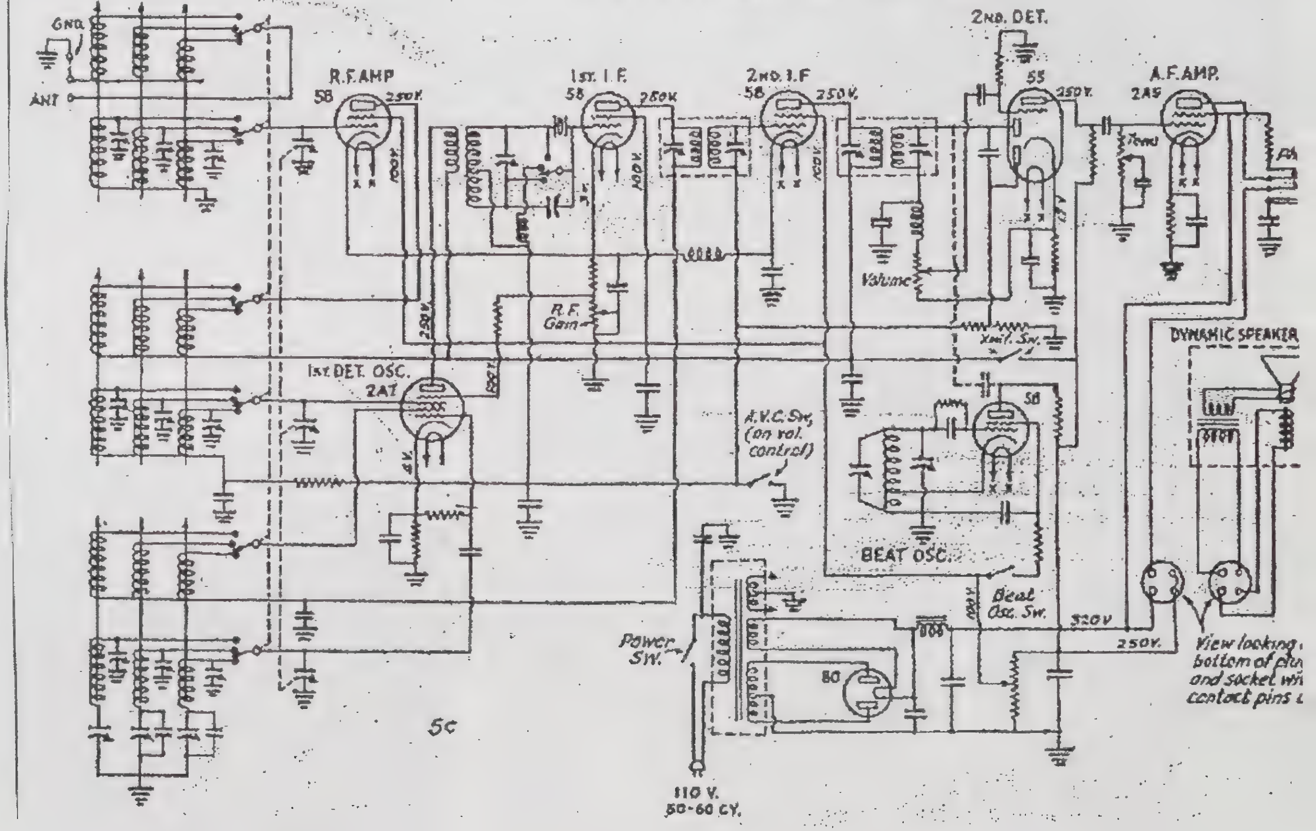
**John Travis**

---

**From:** "al hill" <alhill33@gamewood.net>
**To:** "J W Morris" <jayn4fff@mindspring.com>; "John Travis" <jtravis@buncombe.main.nc.us>; "LEVI ( L.P.)Rigney Jr." <lrigney@webtv.net>; "sonnymorton" <sonnymorton@mindspring.com>; "Tom Creasy" <tomcre@email.msn.com>; "Will Carson" <weck4uo@gamewood.net>; "William A Wells" <waw@gamewood.net>
**Sent:** Saturday, July 08, 2000 8:45 AM
**Subject:** Get Fit

EXERCISE INSIGHTS
>
> ~ It is well documented that for every mile that you jog, you add one
minute
> to your life. This enables you at 85 years old to spend an additional
5
> months in a nursing home at $5000 per month.
>
> ~ My grandmother started walking five miles a day when she was 60.
She's
97
> now and we don't know where the heck she is!
>
> ~ The only reason I would take up jogging is so that I could hear
heavy
> breathing again.
>
> ~ I joined a health club last year, spent about 400 bucks. Haven't
lost a
> pound. Apparently you have to show up.
>
> ~ I have to exercise early in the morning before my brain figures out
what
> I'm doing.
>
> ~ I don't exercise at all. If God meant for us to touch our toes, he
would
> have put them further up on our body.
>
> ~ I like long walks, especially when they are taken by people who
annoy
me.
>
> ~ I have flabby thighs, but fortunately my stomach covers them.
>
> ~ The advantage of exercising every day is that you die healthier.
>
> ~ If you are going to try cross-country skiing, start with a small
country.
>

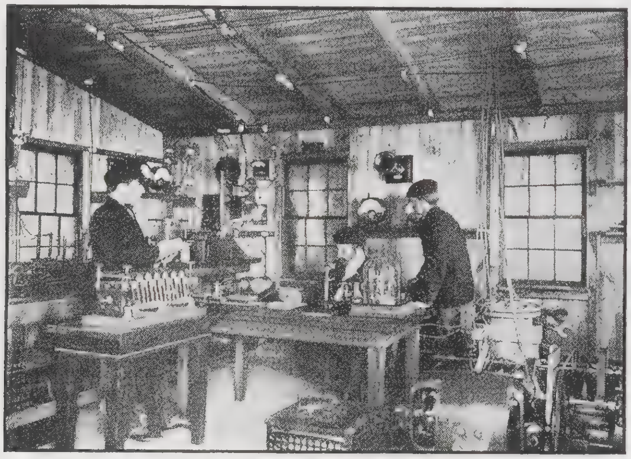
# SILVER 5-C


GND.
ANT
R.F. AMP
58
250V.
100V.
1st. I.F.
58
250V.
100V.
2ND. I.F.
58
250V.
100V.
2ND. DET.
55
250V.
A.F. AMP.
2A5
Tone
Volume
R.F. Gain
1st DET. OSC.
2A7
A.V.C. Sw. (on vol. control)
Xmit. Sw.
DYNAMIC SPEAKER
58
BEAT OSC.
Beat Osc. Sw.
320V
250V.
Power SW.
80
110 V. 50-60 CY.
View looking bottom of plu and socket wi contact pins
5c

but the results of the early tests convinced us we had a method of operation that made quantitative results possible and that was of immeasurable service in studying the effects of various factors in the questions under consideration.

Fessenden was convinced that the successful detector of the future wireless art — if there was to be such a commercial activity — must be constantly receptive, instead of requiring resetting as was characteristic of the coherer; it must have low resistance, so as to best take advantage of resonance; and it must give response proportional to the received energy. It is perhaps difficult for you to realize that these principles were not apparent to everyone. But remember the coherer was generally supposed at that time to have an order of sensitivity not even approached by any other known device. It was the very heart of the then young wireless system. It took real courage in the face of such conditions to hang on to the other type of detector — but Fessenden had it and did just that, even resisting my earnest pleas just to try the coherer out for comparative purposes.

Fessenden devoted his efforts to improvement of his detector and produced a hot-wire barretter similar in general arrangement to a miniature lamp of which the filament was made of Wollaston wire. From it he produced, as the result of an accident during the process of making his hot-wire barretter, a liquid barretter. The hot-wire barretter needed to have the silver coating removed from a very short length of the wire by a nitric-acid treatment. It was during such treatment that Fessenden observed that one of several of such barretters, in this silver-dissolving part of the process, was giving indications on a meter attached to the circuit of signals received from an automatic test sender making D's. An examination revealed that this one had a broken filament while the others were complete. A brief investigation disclosed the fact that this Wollaston wire dipping into the 20% nitric-acid solution was far more sensitive and reliable than any other known type. This detector was the standard of sensitivity for years — in fact until it was displaced by the vacuum tube about 1913.



TWENTY-FIVE YEARS AGO

*A view of the Brant Rock, Mass., station where Prof. Fessenden did much of his development work. Tests from this station led to the erection of the Arlington station in 1909.*

This detector, when the operators listened by means of a telephone receiver in a local shunt circuit to the signals from various sending stations, gave such accurate reproductions that the several stations could be identified by different characteristic sounds just as a friend's voice is recognized by its peculiarities of tonal quality. This difference suggested to Fessenden that, if some means could be found to modulate the radiation by the voice, just as on a wire line the current is changed, radio telephony was possible. He tried to modulate the current in an antenna by placing an ordinary telephone microphone directly in the circuit; then, while Fessenden listened at a receiver, he heard the voice of his assistant as it came to him over the radio. Thus the radio telephone was born in 1901.

The first experiments were made with spark transmitters, but, of course, the crash and noise of the sparks were very disturbing, and it was useful only in proving the correctness of a principle. Higher spark frequencies improved the conditions, but even at frequencies of several thousand sparks per second there was a great amount of noise.

Fessenden had previously observed the desirability of more sustained wave trains to improve resonance selection and one would naturally think of 100% sustained waves if he had become convinced of the advantages of more sustained wave trains. That part had previously been thought out and published by Lodge and others, but how to make the continuous waves was not so apparent.

Fessenden boldly said, "Take a high-frequency alternator of 100,000 cycles per second, connect one terminal to the antenna and the other one to ground, then tune to resonance." That looks simple now, but it wasn't then, I assure you. I remember very distinctly the impression I formed when Fessenden told me of his plan. First I asked how he could get sufficient voltage and he said, "Several hundred volts will be ample, as by resonance I can raise the voltage in the antenna one hundred times, which will be all I require." Even then I was skeptical
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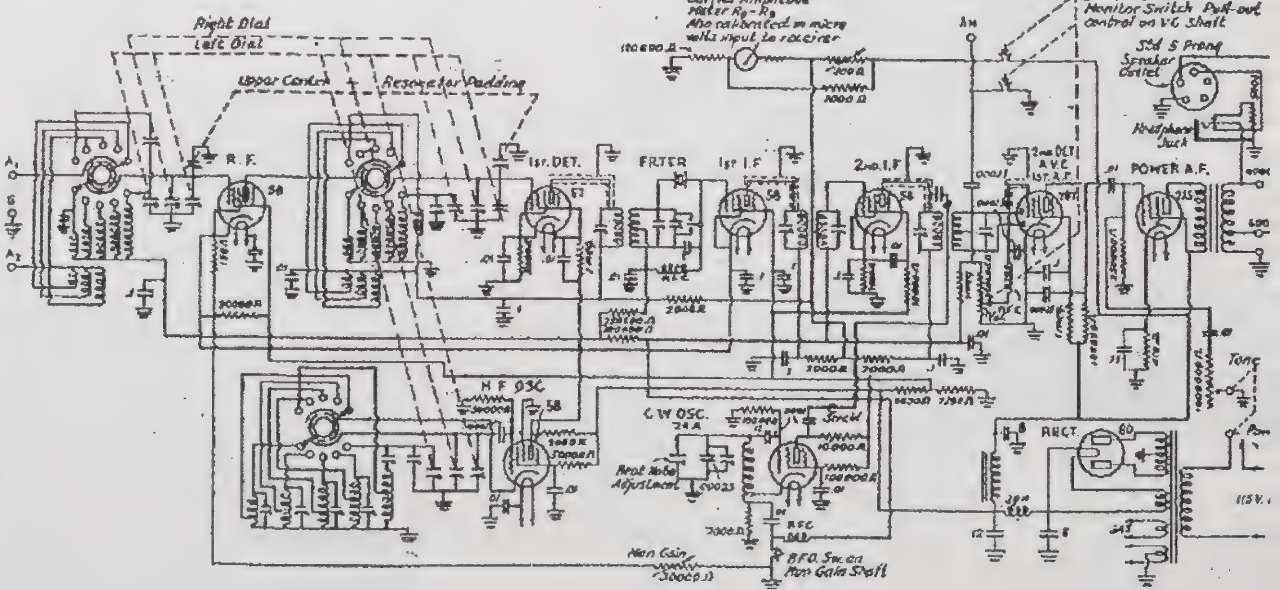
## RME 9-D

DESIGNED for amateur and general communications use, the RME 9-D made by Radio Mfg. Engineers is a Single-Signal (crystal

width at 10,000 times resonance input. "Ef tive" band-width of 50 cycles or less is specif with crystal. A signal-frequency to image



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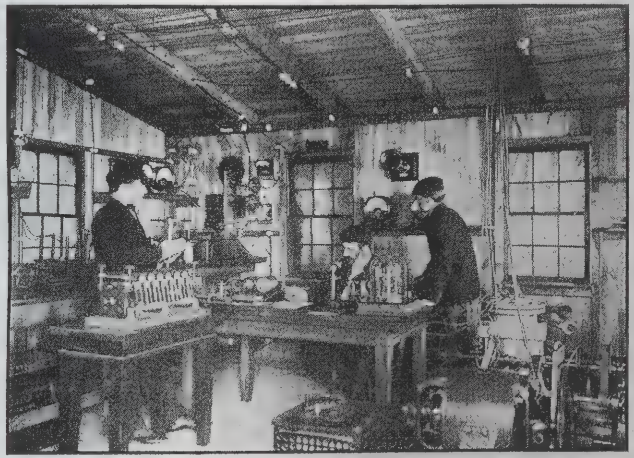

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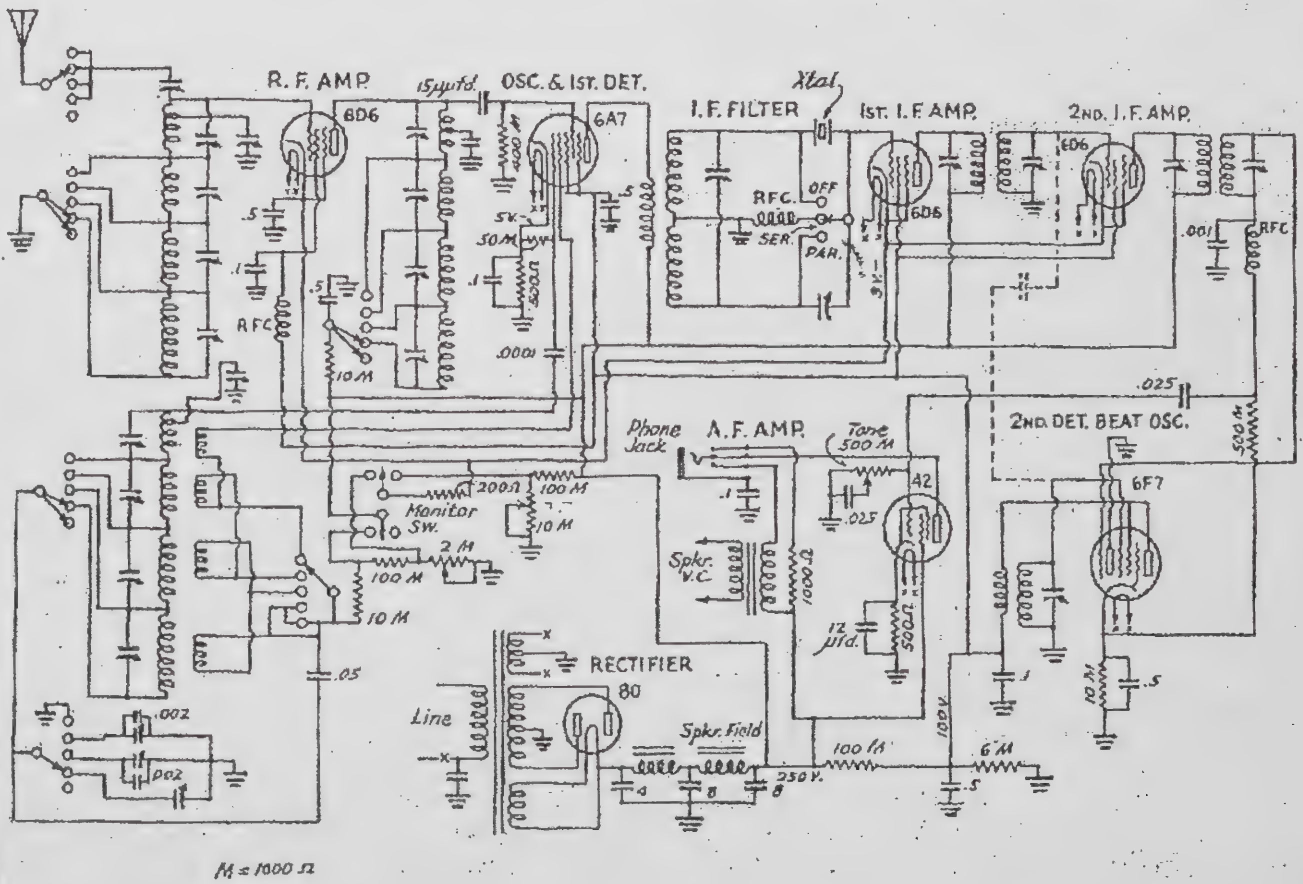
# Hallicrafter's Super-Skyrider

THE Super-Skyrider is of the Single-Signal type, having six tubes of the 6-volt variety in the circuit of the receiver proper in addition to the rectifier of the self-contained power pack. The speaker is also mounted in the same



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The high-frequency alternator received by Fessenden in September, 1906, was immediately put to use in radio telephone experiments, and so successful were these that on Christmas Eve, 1906, the general call "CQ" was sent out from Brant Rock. Then followed a song, the reading of a verse, a violin solo, a speech and an invitation to report the results of the reception by all who heard. This was the first radio telephone broadcast. One can well imagine the feelings of surprise of the lonely ship operators — accustomed to the cold colorless dash and dot of the Morse code — when music suddenly burst upon their ears, to be followed by understandable speech. It would be quite a shock, and I don't doubt that some superstitious operators gave rather serious thought to their mode of living.

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This experimental and development work of Fessenden's was made possible by the financial support and business guidance supplied to him by two other courageous Pittsburghers. These two men, Messrs. T. H. Given and Hay Walker, Jr., in wholesome contrast to the methods followed by most of the radio companies of the period prior to the war, dug down into their own pockets for the necessary funds to carry on. Mr. Given remarked to me several times, "If this radio business turns out as I expect it will, I'll be satisfied with my returns on what I've put into it; if it does not, I, at least, will not have on my conscience the thought that I've wasted the savings of poor scrub-women, widows with dependent children or others who fall such easy prey to the high-powered stock salesmen."

The courage of these two men, who put more than $2,000,000 of their own money into this radio company, is one of the most striking recollections I hold of genuine confidence in the future of radio. Unfortunately, neither reaped the benefits of his sacrifices, as Mr. Given, who bought Mr. Walker's interest during the war, died about one year before broadcasting raised radio to its full stature. It has always been a great regret to me that he could not have lived to see his dreams come true.

The company organized by Given, Walker and Fessenden was operated solely for the purpose of developing the latter's inventions. It was called the National Electric Signaling Company, and not one dollar's worth of stock was offered for sale to the public. Particular emphasis is laid upon this fact because those were the days when selling stock in a new wireless company was the "racket" of the time.

This particular company devoted its energies to developing a system to engage in the communication business. A number of stations were constructed for development uses. First there were three, one at Old Point Comfort, a second at Ocean View and the third one at Cape Charles. These were small stations with gasoline-engine-driven dynamos and plain spark-gap oscillation generators. Next a pair of stations, one at Jersey City and the other at Collingswood, N. J., were built. There was then erected a third station at Washington, D. C. These stations exchanged code messages at times, but were not sufficiently free from interference and fading to give a reliable service.

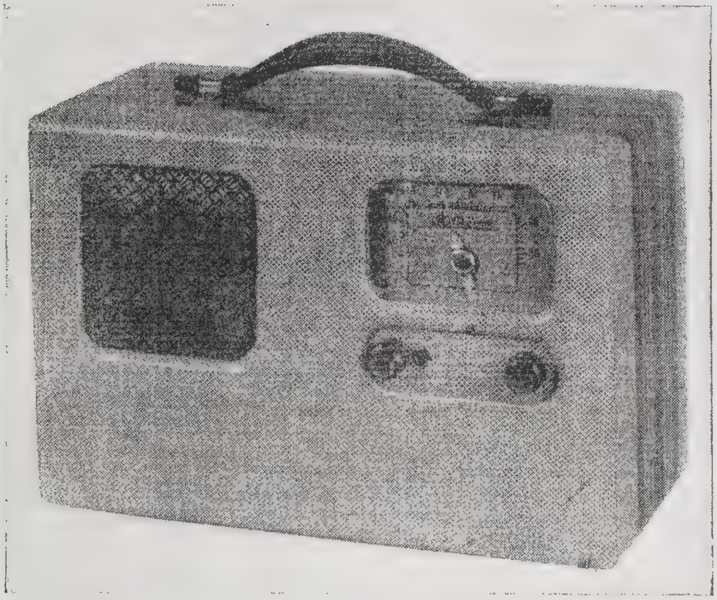
Then, with the experience gained in the operating of these several stations, an ambitious program was undertaken of erecting two stations for experimental transatlantic operation. One station was located at Brant Rock, Massachusetts, and the other at Machrihamish, Scotland. These stations were constructed in 1905 and were powered by 35-kw. 125-cycle alternators — with rotary spark gaps that gave a spark frequency of 250 sparks per second. The antenna systems consisted of a single straight tube, 36 inches outside diameter and 420 feet long. This tube was built in eight-foot sections, bolted together. It rested on a steel sphere at the bottom and was guyed at four points along its length. Both the guys and the tower were insulated from earth. At first the tube alone constituted all of the antenna. Later, a form of umbrella structure carrying an

(*Continued on page 90*)

# *How to Build the* Meissner A.C.-D.C. Battery 3-Way Portable

### Henry Townsend

**This portable works on 110 volts A.C.-D.C. and also on batteries when desired. It uses 6 tubes, has a "built-in" loop antenna and works a loudspeaker. It packs a good wallop and has an R.F. amplifier to boost weak signals.**



This portable receiver is well designed and will appeal to the average set-builder, as it is available in kit form, complete with speaker and cabinet.

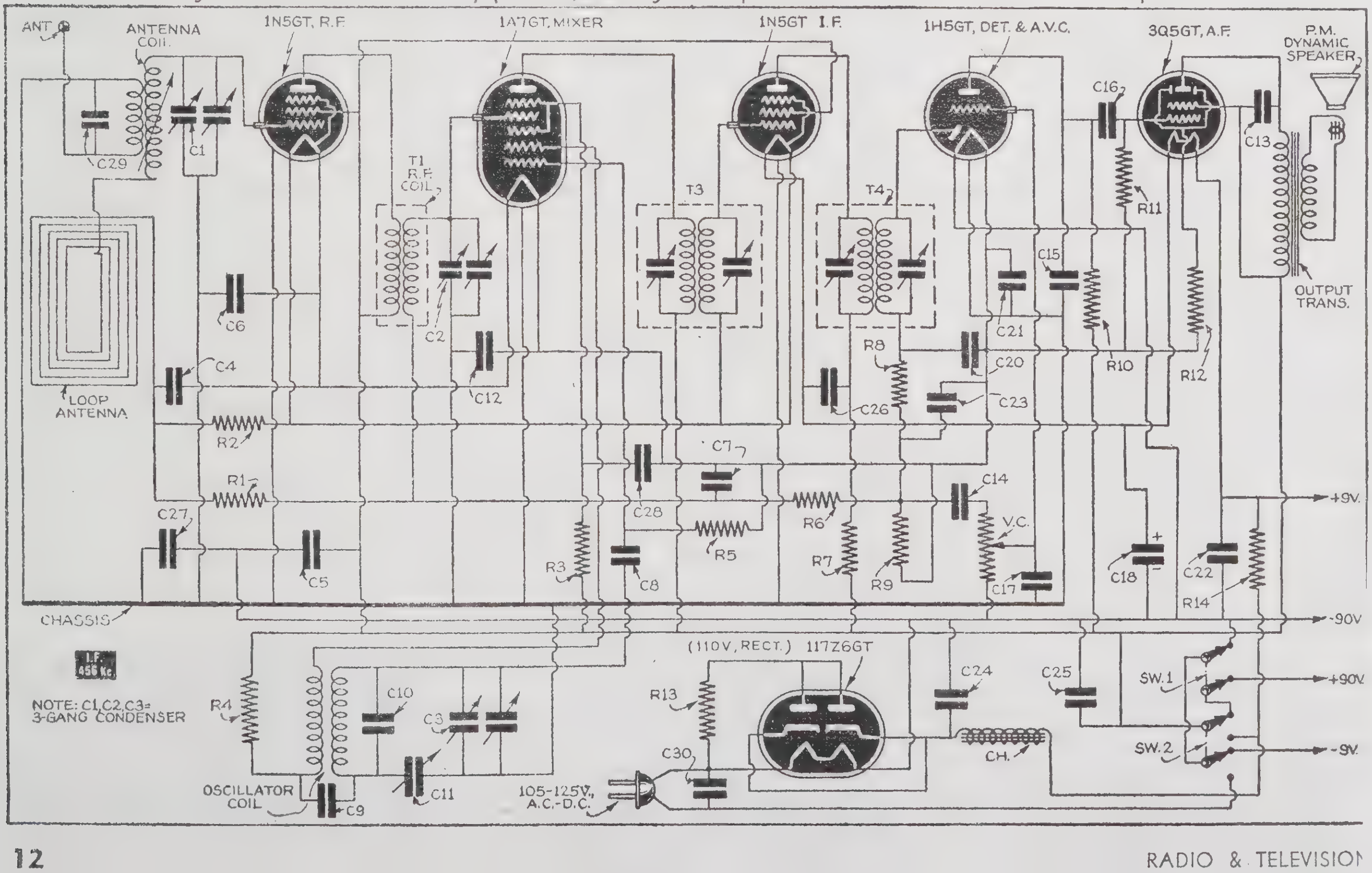
AS the summer season approaches, portable radio receivers are in great demand. The one here illustrated is a very efficient one, sufficient amplification of the signals being provided, so that even the weaker stations can be picked up on the loop antenna provided in the set. The trouble with a great many portable receivers is that there is insufficient amplification of the signal picked up in the loop aerial; the consequence is that the average station is barely audible on the loudspeaker. An R.F. amplifying stage to boost these weak signals, before they are passed into the mixer stage, is here provided.

A 1N5GT tube is used in the R.F. booster stage, and an optional antenna coupling circuit is provided, so that where it is desirable and convenient, an antenna wire (simply a 20 ft. piece of wire laid on the ground) will bring in excellent results, whether the wire is bare or insulated. The mixer tube is a 1A7GT followed by an I.F. amplifier, an 1N5GT. The second detector and AVC tube, is a 1H5GT, and the final audio amplifier stage utilizes a 3Q5GT. For 110 volt A.C. or D.C. operation a rectifier tube, a 117Z6GT tube is employed, with a suitable filtering circuit, comprising an iron core choke and good size condensers.

All of the parts for building the set are available in kit form. Many readers will probably prefer this method whereby to build up this portable superhet receiver.

The loudspeaker used is a 5-inch diameter permanent-magnet dynamic type, with a suitable output transformer to feed into it.

Diagram of the all-around 3-way portable, showing the loop antenna and rectifier tube for 110 volt operation.



**Wet ELECTROLYTICS**

Type PG600—Max. 600 v. D.C. Surge: 1⅜" and 1½" dia. can, 3 7/16 to 4 15/16" high, 4 to 16 mfd., $1.35 to $2.00 list.
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Type PG350—Max. 350 v. D.C. Surge: 1⅜" and 1½" dia. can, 3½ to 4" high, 8 to 40 mfd., $0.90 to $1.80 list.
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Type PGM350—Max. 350 v. D.C. Surge: 1" dia. can, 3½ and 4½" high, 8 to 20 mfd., $0.90 to $1.40 list.
Type PGM250—Max. 250 v. D.C. Surge: 1" dia. can, 3½ and 1½" high, 8 to 40 mfd., $0.80 to $1.20 list.
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All of the resistors and condensers used are of standard type.

In order to obtain the most satisfactory results in construction and operation of this receiver the following instructions should be carefully followed, placing each part in the position shown and arranging the wiring as indicated in the pictorial wiring diagram.

### Assembly

1. Mount the six tube sockets with ¼" screws and nuts. Use a lockwasher under each nut in the assembly. Be sure to turn each socket so that the key-way in the central hole points in the direction shown in the pictorial diagram.

2. Take the 3-gang tuning condenser and place a nut on each of the three mounting studs. Then place the condenser on the chassis and fasten in place with three nuts and lockwashers. The three nuts placed on the studs first will serve as spacers to raise the condenser slightly above the chassis.

3. Solder a four-inch length of green stranded wire to the top terminal on the *front* section of the tuning condenser and a two-inch length of the same wire to the corresponding terminal of the *rear* section.

4. Mount the antenna coil on the gang condenser shield in accordance with the illustration in the lower left hand corner of the schematic diagram, then mount the condenser shield on the gang condenser.

5. Prepare the R.F. coil, 01606, for mounting. First remove the coil by taking out the screw in the top of the can. Then solder a 4" piece of stranded green wire to the lug which in the pictorial diagram has no wire attached below the chassis. Reassemble the coil in the shield, running the green lead out through the hole in the top of the can and at the same time mount the tin shield as shown in the top view of the chassis illustration in the lower left corner of the schematic diagram. There is a locking pin in the bracket that holds the coil in the can. This pin should engage the small hole in the top of the can for the purpose of properly locating the coil.

6. Place the five rubber grommets in the chassis openings at the places shown in the pictorial diagram.

7. Mount the two I.F. transformers (T3 and T4) bringing the wire leads out through the holes in the chassis, observing the color code shown in the pictorial diagram. Place two of the tie-point strips on the mounting studs of T3 before applying the lockwashers and nuts.

8. Mount the long terminal strip on the back of the gang condenser as shown in the rear view of the receiver illustrated on the schematic diagram. The method of mounting is to solder the two mounting feet directly to the end plate of the gang condenser. A very hot iron facilitates this operation. Then mount the remaining terminal strips as shown in the pictorial diagram.

9. Mount the oscillator coil (T2) exercising care to *see that the lug with green dot is located in the upper left hand corner as shown.* Mount the padder condenser (C11) on the rear of the chassis as shown.

10. Remove the large nut and lockwasher from the volume control and mount this unit on the front of the chassis. The projecting metal tip fits into a small hole in the chassis to locate the control and prevent it from rotating.

11. Mount the electrolytic filter condenser on the bakelite mounting strip, twisting the 3 mounting lugs about ⅛ turn to make a tight fastening. Exercise care to see that the position of the condenser corresponds to that shown in the pictorial diagram. Mount the above assembly *on top* of the chassis and cover the electrolytic condenser with the black cardboard cover provided. Mount the filter choke 19341 and the change-over switch (S2).

### Wiring

Having completed the assembly of all the parts which are fastened to the chassis, the wiring of the set may be started. The assembly of the "Off-On" indicator disc and the tuning dial will be left until after the wiring has been completed.

Have the soldering iron clean and hot. Solder one point on each socket-mounting to the chassis. A small spot of solder applied near one of the mounting screws on each socket and sweated to the chassis with the soldering iron will do this job nicely.

The #1 pin on four sockets should be connected to the nearest lug on the socket mounting-saddle by means of a short piece of bare wire. Locate, install and solder these connections. Next wire the filament circuit according to the pictorial diagram. (The filament circuit appears on pins #2 and #7 on every socket.)

Cut the wires from the I.F. transformers (T3 and T4) to the proper length and solder them to the terminals indicated. Follow the color code carefully.

Place and connect all other wiring as shown, in any convenient order. The battery and speaker wires which extend through the grommet at the rear of the chassis should be left a foot or more long. A piece of shielded wire about eight inches long is connected to the middle terminal on the volume control and brought up to the top of the chassis through the rectangular opening. This wire will provide a top grid connection for the 1H5GT tube.

Connect the .00001 mica condenser (color code brown, black, black) on the oscillator coil as shown. *If the wrong condenser is used in this place the radio will not work.*

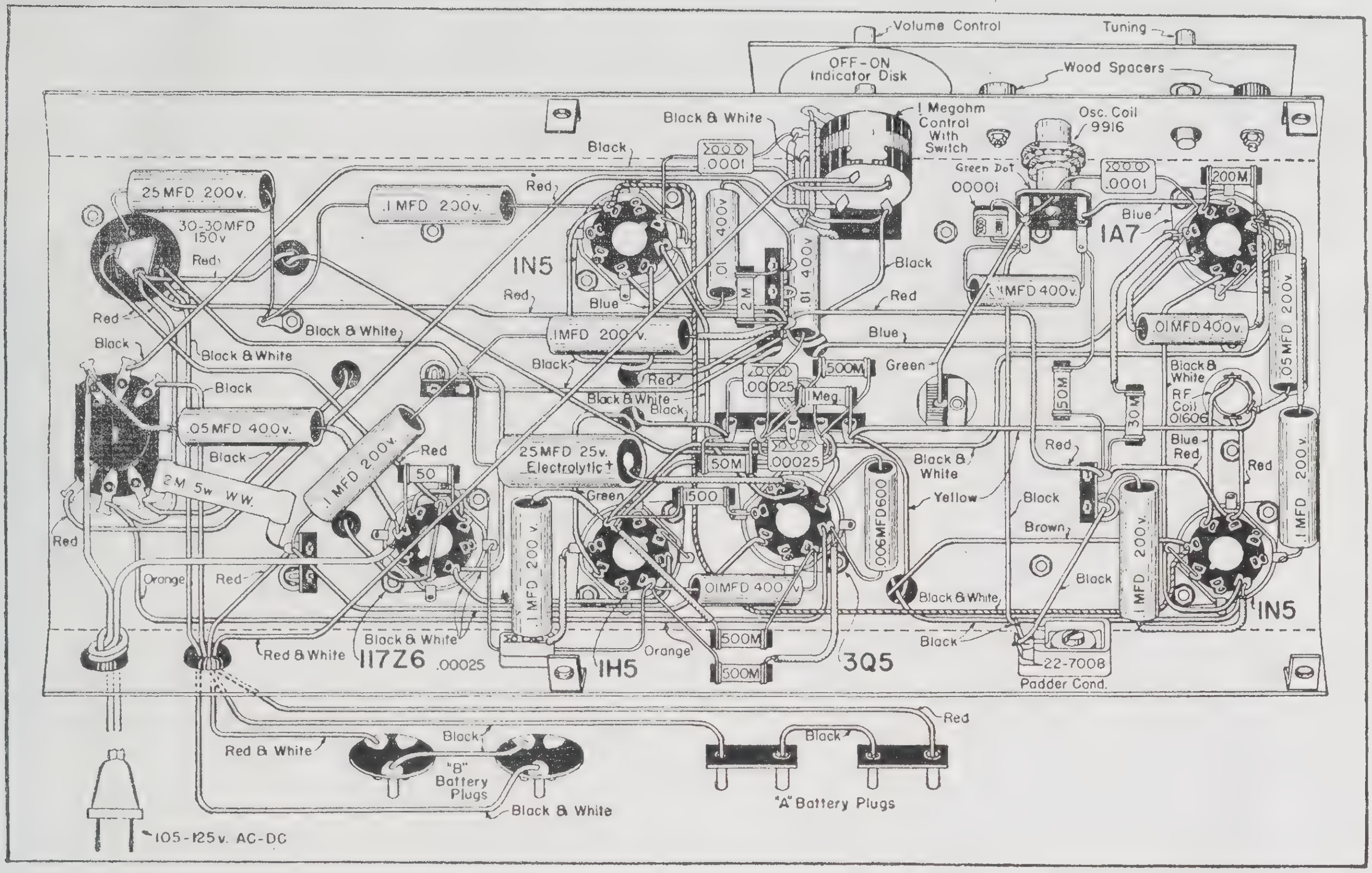
Connect the condensers and resistors as shown on the pictorial wiring diagram. Use the braided insulating sleeving on bare wires where indicated or wherever else it may seem necessary to prevent such wires from touching each other or the chassis.

Insert tubes in the sockets and determine the proper length of grid leads for top connections. Solder the four grid clips to the grid wires as shown. Note that two wires are connected to one clip on the 1A7GT tube.

Complete the wiring of the antenna coil and of the terminal strip that appears on the rear of the gang condenser.

*Check all wiring and connections very carefully.*

Place the red and white "Off-On" indicator disc on the volume control shaft and then mount the dial. Use the two black wood spacers between the dial plate and the front of the chassis. See that the tuning condenser plates are completely open. Place the pulley on the shaft in such a position that the hole in the rim of the pulley points where 7 appears on a clock face when the set is viewed from the front, right side up. Tighten the set screw. Close the gang condenser and slide the pointer until it coin-



Picturized wiring diagram for the 3-way portable, looking at the bottom of the chassis.

cides with the last line at the low frequency end of the dial.

Connect the battery plugs paying special attention to the pins to see that the wires are connected as shown. On the plugs with only two pins each, one is considerably larger than the others so that the plugs can be inserted in the batteries only one way. Be sure the wires are connected to the pins of proper size.

Place the grid clips on the top grid connections of each tube and bend the metal grid shield (mounted on top of the R.F. coil) so that it lies close to the grid wire coming out of the top of the coil, but not touching the grid clip.

### Testing Preparations

Since it is impossible to adjust the set in the cabinet it is necessary to make a temporary set up in which the receiver, loop and batteries occupy approximately the same position with respect to each other as they would if assembled in the cabinet.

First, remove the sliding shelf from the cabinet and mount the set thereon. Temporarily connect the loud speaker to the terminal strip on top of the chassis and the loop to the terminals indicated in the partial pictorial diagram shown in the lower right hand corner of the schematic diagram. The loop should be so connected that the turn nearest to the set is attached to the terminal strip on the gang condenser. The other loop terminal connects to a lug on the antenna coil. The batteries should be placed under the set and the loop should be stood up behind the set so that the set, batteries, and loop bear the same relation to each other as if they were mounted in the cabinet in the normal manner.

### Alignment

For alignment purposes, a good service oscillator will be very helpful and is recommended if available. Satisfactory results may be obtained, however, by tuning in strong broadcast signals near the alignment frequencies specified.

Turn the change-over switch on the top of the chassis to the "battery" position (counter clockwise position viewed from above). *Do not connect the line cord to the power line.*

Connect the output of the service oscillator to the top grid of the 1A7GT tube through a .01 to 1.0-mf. condenser and the low side of the generator to chassis. Connect a suitable output meter to the voice-coil of the speaker. If no output meter is available, the variation in volume of sound from the speaker may be used as an indication of maximum signal for each adjustment. Set the oscillator output to 456 kilocycles and the receiver dial to 600 kc.; then adjust the trimmers in the top of each I.F. transformer for maximum output. Use only enough output from the oscillator to obtain a satisfactory reading on the output meter or an audible note in the speaker. Best results will be obtained on the lowest possible signal input to the receiver. Repeat the adjustment of these trimmers several times to make sure that the best possible adjustment has been obtained.

Remove the service oscillator connections from the receiver. Connect to the generator output terminals one or two turns of wire about one foot in diameter and place this loop close and parallel to the loop on the receiver.

Check the pointer position to see that it coincides with the last line at the low frequency end of the dial.

Set the generator to 1400 kc. Adjust the tuning knob of the receiver so that the pointer indicates the same frequency. Adjust the oscillator trimmer (middle) on the gang condenser until a signal is heard. Adjust the other two trimmers for maximum response, moving the generator and attached loop away from the receiver to reduce signal as the receiver becomes progressively more sensitive, during alignment. Reduce the generator output if necessary to keep the sound output low, but this should be done only after the generator and attached loop have been moved some distance from the receiver loop, for example one foot or more.

Set the generator at 600 kc. and attempt to tune in the 600 kc. signal from the generator. It may be necessary to move the generator and attached loop closer to the receiver during preliminary padding adjustments, but the generator should be moved away from the receiver as soon as increased sensitivity of the receiver permits. Adjust the padding condenser on the rear of the chassis in the conventional manner, while rocking the gang condenser. When this operation is complete, adjust the antenna circuit by turning the screw which projects from the base end of the antenna coil. When maximum sensitivity is reached, a lock nut should be run down on the screw to preserve the adjustment.

The generator should now be reset to 1400 kc., the receiver again set to the same frequency, and the 1400 kc. aligning and 600 kc. padding repeated for maximum sensitivity.

The cabinet should be prepared for the

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Ideal for trapping spies, fifth columnists, etc. Keeps snoopers away from valuables or important secret documents. The perfect alarm device since it protects by invisible electrostatic means. When electrostatic field is disturbed by the approach of person or object, relay operates instantaneously. Relay may be connected to ring alarm bell or gong, turn lights on or off, start or stop motor, etc. Device may be used with counter to register number of persons or cars entering door or gateway or passing or approaching any point. Employs four tubes.

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set by fastening the dial crystal (window) in the cabinet with tacks.

The speaker should now be mounted in the cabinet followed by the receiver, batteries and loop.

The 600 kc. adjustment of the antenna circuit should be repeated because the effective inductance of the loop may be changed by slightly different positions of the loop with respect to adjacent metal objects.

Before assembling the back onto the cabinet, solder the lead to the external antenna connector which should be mounted on the back directly behind the round hole.

The receiver should now be ready for reception of broadcast stations on batteries.

### A.C.-D.C. Operation

For A.C. operation turn the change-over switch to the clockwise position and plug the line cord into a power receptacle furnishing power at 105-125 volts at 50 to 60 cycles.

For D.C. operation the same directions as for A.C. apply except that there is one position of the line plug which will not make the set operate even though the tubes light up. In that case it is only necessary to reverse the line plug. On line power operation the tubes take about a minute to warm up before normal operation is attained.

*On line power operation it is recommended that the door on the back of the set be allowed to remain open to prevent deterioration of the batteries which rapidly lose their efficiency if held at high temperatures for long periods of time.*

### Complete Parts List

NO. 12-1031 ESSENTIAL KIT

1—Punched steel chassis, 11-8256, 11¾" x 4½" x 1 3/16"
1—Dial plate assembly, broadcast band, 19531
1—Rectangular Cro-glass dial crystal, 19535
1—3-gang, 365 mmf. tuning condenser, 21-5215, C1-C2-C3
1—Cadmium steel condenser shield, 25-7831
1—Complete loop antenna, 01607, L
1—Unshielded antenna coil, 01608, T6
1—Shielded R.F. coil, 01606, T1
1—Unshielded oscillator coil, 9916, T2
1—Adjustable padder condenser, 22-7008, C11
1—456 kc. input I.F. transformer, 16-5741, T3
1—456 kc. output I.F. transformer, 16-5743, T4

NO. 10-1190 COMPLETE KIT (less cabinet)
All parts listed above plus the following:

1—Filter choke, 19341, Ch
1—5" PM dynamic speaker with transformer, 19532
1—1 meg. volume control with switch, 19533, VC & S1
1—DP-DT switch, 19639, S2
1—Red and white "off-on" indicator disc, 19534
6—.1 mf., 200-volt paper condensers, C5-C6-C12-C19-C21-C22
2—.05 mf., 200-volt paper condensers, C4-C7
5—.01 mf., 400-volt paper condensers, C9-C14-C16-C26-C28
1—.25 mf., 200-volt paper condenser, C27
1—.05 mc., 400 volt paper condenser, C30
1—.006 mf., 600-volt paper condenser, C13
3—250 mmf., mica condensers, C15-C20-C23
2—100 mmf., mica condensers, C8-C17
1—50 mmf., mica condenser, C29
1—10 mmf., mica condenser, C10
1—25 mf., 25-volt electrolytic condenser, C18
1—30-30 mf., 150-volt electrolytic condenser, C24-C25
1—Insulating paper cover for above condenser
1—Bakelite mounting plate for filter condenser
1—50 ohm, ¼-watt fixed resistor, R13
1—1500 ohm, ¼-watt fixed resistor, R12
1—2000 ohm, ¼-watt fixed resistor, R7
1—2000 ohm, 5-watt wire-wound resistor, R14
1—30,000 ohm, ¼-watt fixed resistor, R3
2—50,000 ohm, ¼-watt fixed resistors, R4-R8
1—200,000-ohm, ¼-watt fixed resistor, R5
4—500,000-ohm ¼-watt fixed resistors, R1-R9-R10-R11
1—1-megohm, ¼-watt fixed resistor, R6
1—5-megohm, ¼-watt fixed resistor, R2
6—Molded bakelite octal tube sockets, 23-8209
1—Socket and plug for external antenna connection
1—Type G1222K tube shield, 19637
1—Special shield fin to mount on R.F. coil, 9925
1—Shakeproof ground lug, 11422
2—Tie lugs, single insulated terminal, 25-5732
2—Tie lugs, two insulated terminals, 25-5731
1—Tie lug, three insulated terminals, 25-6715
1—Tie lug, four insulated terminals, 25-6716
1—Tie lug, five insulated terminals, 25-6717
2—¼" rubber grommets, 14217
1—5/16" rubber grommet, 19216
2—⅜" rubber grommets, 14211
1—Line cord and plug assembly, 12434
2—Special connection plugs for "A" batteries, 19641
2—Special connection plugs for "B" batteries, 19642
4—Grid clips for top grid connections on tubes
1—Lever-type switch knob, 19640
2—Round bakelite control knobs, 19275
2—Black wood spacers for dial mounting
2—6/32 x ⅞"—long screws for dial mounting
3—8/32 x ¼"—long screws for condenser shield
2—No. 2 x ⅜"—long wood screws for antenna socket
4—No. 3 cut tacks for mounting dial crystal
25—6/32 x ¼"—long steel machine screws
43—6/32 x ¼" hexagon steel nuts
44—No. 6 steel lockwashers
1—Length green stranded wire for grid connections
5—Lengths stranded wire, assorted colors
7—Lengths solid wire, assorted colors
1—Length braided insulating sleeving
1—Length rosin-core solder

No. 10-1189 COMPLETE KIT (with cabinet)
All parts listed above plus the following:

1—Portable cabinet with removable back, 11-8257
4—No. 6 x ¾"—long wood screws for back cover
4—6/32 x ¼" hex nuts for speaker mounting

ACCESSORIES REQUIRED: 2 1N5GT tubes, 1 1A7GT tube, 1 1H5GT tube, 1 3Q5GT tube, 1 117Z6GT tube, 2 45-volt "B" batteries (Burgess A30M or equivalent) and 2 4½-volt "A" batteries (Burgess G3 or equivalent).

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# REMOVING RECORDING THREAD

● ONE of the most difficult problems confronting the recorder is the removal of the continuous line of thread from the revolving disc while cutting those instantaneous blanks.

Most recording mechanisms have a center spindle for the thread to wind around but the problem is to get the thread over to it, wound around it and keep it off the remaining surface of the uncut disc.

Some machines have air blowers to accomplish this, while others use felt or other soft cloth to brush the thread toward the center. And most recorders will notice that the air blower is not strong enough or that it is not easy to move the thread with felt or other soft cloth, due to the static electricity absorbed by the thread.

But quite by accident I found that by using an ordinary 10 cent paint brush and by lightly brushing the thread toward the center that the problem is completely overcome.

The soft bristles of the brush tangle up in the thread and easily carry it to the center spindle where the brush is held for a few seconds until the thread winds around the shaft, then the process is repeated. This keeps the uncut surface clean and the cutting needle free from entanglements; and the softness of the bristles will in no way mar even the most mirror-finished recording blank. The brush should be held at an angle in order to pick up the threads.

I'm sure that there are many radio men who will or have taken up recording, either as a hobby or as a business, and would like helpful hints and articles on recording. How about some?—*A. H. Davison.*

Fine—send 'em along.—EDITOR.

(Collins 75A-4)

cal" must have some degradation after 50 years of service, so I opted for the new choice, a fresh Dave Curry Longwave Filter from Electric Radio. As the audio was later to prove, this was both an excellent choice and value.

The last step in this effort was to address the cosmetic condition of the receiver. Cleaning a 50-year-old radio is not an easy task. One wants to do a through job and yet not damage the paintwork or disturb the silk-screened lettering on the front panel. Based on the collective input of others and my own trial and error, I have developed a comprehensive cleaning process that really seems to bring this old gear back to life. The cabinet was the first item to be addressed. The black crackle finish, tainted with nicotine, was treated to a liberal coating of Go-Jo hand cleaner. If you use this cleaner, be certain to get the type without pumice. During cleaning, it never fails to amaze me how much dirt and grime can be found hiding in black crackle paintwork. With its textured surface, the hills and valleys of these finishes have a Velcro-like hold on the dirt and dust. Once the Go-Jo cleaner was rinsed off, carrying with it yellow streams of pungent nicotine, I treated the freshly cleaned paint to a light overspray of Wurth Cockpit Cleaner, a product originally intended for use on auto interiors. With the exterior looking like new, it was time to turn my attention to the inside. Fortunately, this A-4 had a very clean chassis, and all that was necessary was a through cleaning with Windex, followed by a light wipe down with WD-40 to prevent corrosion. A few evenings of work and the dust and debris from nearly half a century were gone, and the old radio looked like the day it came off the assembly line.

With the cabinet and chassis fresh and shiny, the moment of truth was now at hand. How would my countless hours of handiwork, the numerous fresh capacitors, resistors, and fancy new mechanical filter all work? Making certain the correct fuse was installed, just in case, I cautiously turned the 75A-4's power switch on, watching for signs of telltale sign of smoke and the dreaded frying noise that accompanies a component giving up the ghost. To my delight, and perhaps astonishment, the tube filaments began to glow and shortly a soft hum emanated from the speaker, just as it should. Encouraged, I connected my test antenna— a 5 foot length of wire lying on the test bench— to the receiver's antenna terminals. The moment of truth was at hand as I reached out and turned the band switch down to 160 meters. On 160 I knew I could just catch the top of the AM broadcast band, and hoped to snag my favorite "big band" station, 1490 WBCI. I slowly turned the tuning knob down toward the bottom of the band. The dial calibration was not quite right, but after some tweaking and tuning the melodious sounds of Nat King Cole's "Unforgettable" emanated from the A-4's speaker, perhaps for first time in decades.

For me, there are few things that can compare to bringing back to life a radio that has been sitting dead for 10, 15 or 20 years. Repairing an old radio is really a never-ending project, and in the coming weeks I discovered and quickly repaired other faults; a tube here, a resistor there, a potentiometer that crackled when turning. But for me, it is these little tweaks and fixes that I find most gratifying. Sure, I still have to do the dial calibration and the RF and IF alignments, but for right now, I think I'll just sit back and listen to some music from my 50 year old time machine.

*73, Bruce, W1UJR*

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by Brian K. Harri
3521 Teakwood L
Plano, Texas 7507
brian.k.harris@ph

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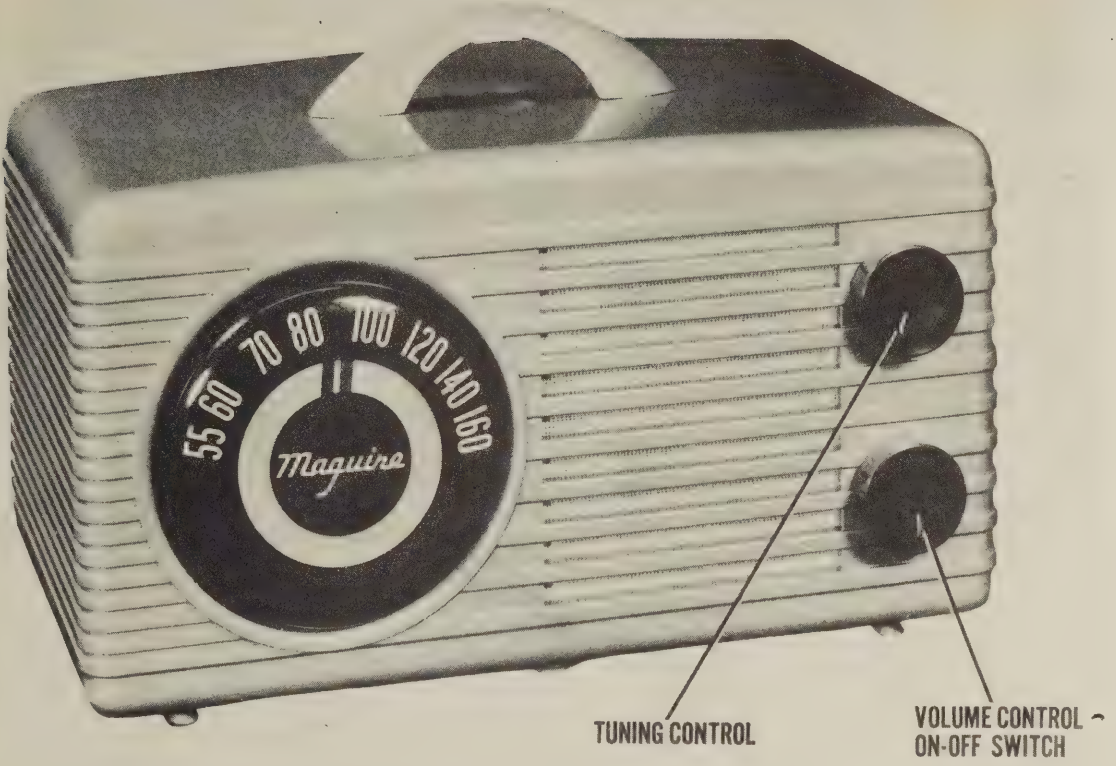
# MAGUIRE
# MODEL 661, 661-A



MAGUIRE MODEL 661

| | |
|---|---|
| **TRADE NAME** | Maguire Models 661, 661-A |
| **MANUFACTURER** | Maguire Industries Inc., W. Putnam Ave., Greenwich, Conn. |
| **TYPE SET** | AC-DC Operated Superheterodyne Receiver - Self Contained Loop Antenna |
| **TUBES** (FIVE) | Types, 12SK7 RF Amp., 12SA7 Converter, 12SK7 IF Amp., 12SQ7 Det.-AVC-AF, 50L6GT Power Output. |
| **POWER SUPPLY** | 105-125 Volts AC-DC |
| **TUNING RANGE—BROADCAST** | 530-1620KC |
| RATING | .235 Amp. @ 117 Volts AC |

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer if available. If not, connect capacitor in series with low side of signal generator to B-. Volume control at maximum volume position and output from signal generator no higher than is necessary to obtain output reading. Use insulated alignment screwdriver for adjusting.

| DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | RADIO DIAL SETTING | OUTPUT METER | ADJUST | REMARKS |
|---|---|---|---|---|---|---|
| .1 MFD. | High side to stator of rear section of variable. Low side to B-. | 455KC | High freq. end. (Variable fully open). | Across voice coil | A1,A2, A3,A4. | Adjust for maximum output. |
| 200 MMF. | High side to ant. lead. Low side to B-. | 1620KC | " | " | A5 | " " " " |
| 200 MMF. | " | 1400KC | Tune for maximum output. | " | A6 | " " " " |

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"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1947 by Howard W. Sams & Co., Inc., Indianapolis, Indiana, U. S. A. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc."

# PARTS LIST AND DESCRIPTIONS

## TUBES

| ITEM No. | USE | REPLACEMENT DATA |  | RMA BASE TYPE | INSTALLATION NOTES |
|---|---|---|---|---|---|
|  |  | MAGUIRE PART No. | STANDARD REPLACEMENT |  |  |
| 1 | RF Amp. | 12SK7 | 12SK7 | 8N |  |
| 2 | Converter | 12SA7GT | 12SA7GT | 8AD |  |
| 3 | IF Amp. | 12SK7 | 12SK7 | 8N |  |
| 4 | Det.-AVC-AF | 12SQ7GT | 12SQ7GT | 8Q |  |
| 5 | Power Output | 50L6GT | 50L6GT | 7AC |  |

## CAPACITORS

**Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING |  | REPLACEMENT DATA |  |  |  |  |  | IDENTIFICATION CODES AND INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|---|
|  | CAP. | VOLT | MAGUIRE PART No. | SOLAR PART No. | SPRAGUE PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. |  |
| 6A | 50 | 150 |  | DSB-5030-150 | TA-530 | PRSA150-40-40 | BRD3515 | 2N520 | Filter - Red |
| B | 30 | 150 |  |  |  |  |  |  | " - Green |
| 7 | .05 | 400 |  | S-4-05 | TC-15 | 484-05 | DT4S5 | TP426 | Line Filter |
| 8 | .1 | 400 |  | S-4-1 | TC-1 | 484-.1 | DT4P1 | TP428 | RF Bypass Pwr. Supp. |
| 9 | .01 | 400 |  | S-4-01 | TC-11 | 484-01 | DT4S1 | TP421 | Output Plate Bypass |
| 10 | .01 | 400 |  | S-4-01 | TC-11 | 484-01 | DT4S1 | TP421 | Audio Coupling |
| 11 | .01 | 200 |  | S-4-01 | TC-11 | 484-01 | DT4S1 | TP421 | " " |
| 12 | .05 | 200 |  | S-4-05 | TC-15 | 484-05 | DT4S5 | TP426 | AVC Filter |
| 13 | .2 | 400 |  | S-4-2 | TC-2 | 484-.2 | DT4P2 | TP429 | Line Isolation |
| 14 | .01 | 200 |  | S-4-01 | TC-11 | 484-01 | DT4S1 | TP421 | Ant. Coupling |
| 15 | 100 | 500 |  | M0.5-31 | 1FM-31 | 1468-0001 | 5W5T1 | MC235 | Audio Plate Bypass |
| 16 | 100 | 500 |  | M0.5-31 | 1FM-31 | 1468-0001 | 5W5T1 | MC235 | Osc. Grid Capacitor |
| 17 | 47 | 500 |  | M0.5-45 | 1FM-45 | 1468-00005 | 5W5Q5 | MC225 | RF Coupling |

## CONTROLS

| ITEM No. | RATING |  | REPLACEMENT DATA |  |  |  | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|
|  | RESISTANCE | WATTS | MAGUIRE PART No. | MALLORY PART No. | IRC PART No. | CLAROSTAT PART No. |  |
| 18A | 500KΩ | 1 |  | MR48 | D13-133 | M-60-Z | Volume Control |
| B | Shaft |  |  | Not Req | A | Not Req. | Attach to 18A per instructions |
| C | Switch |  |  | M26 | 41 | SW-A | " " " " " |

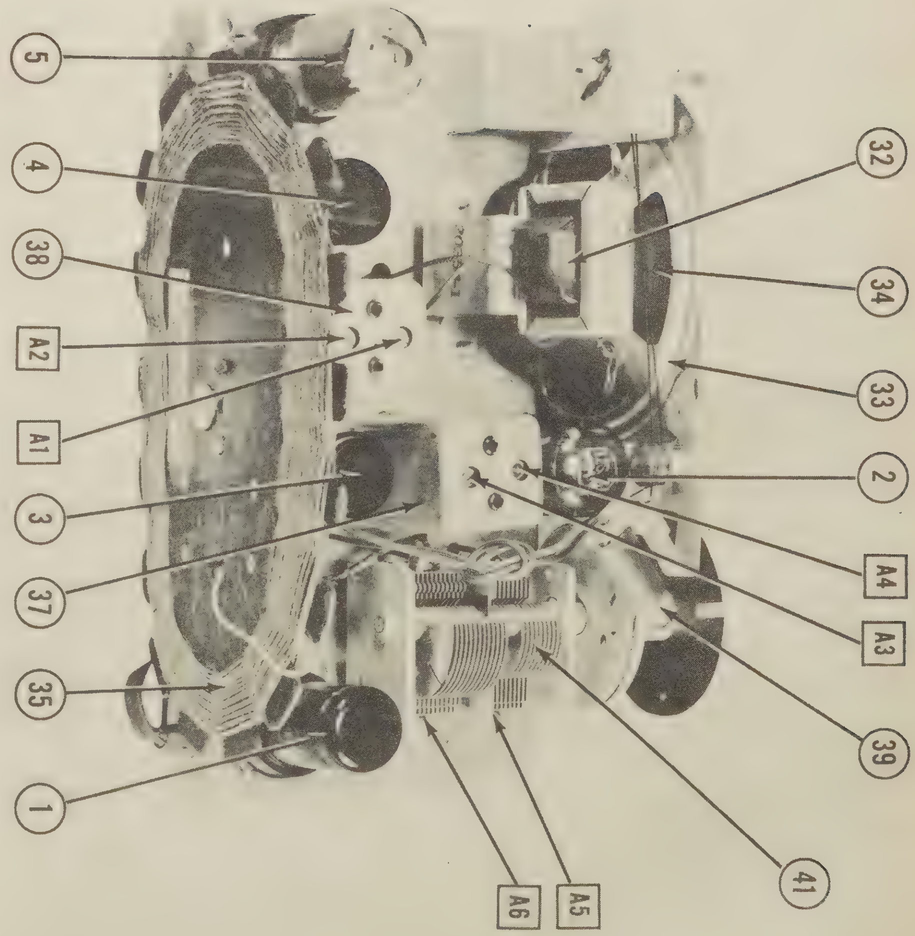
## RESISTORS

| ITEM No. | RATING |  | REPLACEMENT DATA |  | IDENTIFICATION CODES |
|---|---|---|---|---|---|
|  | RESISTANCE | WATTS | MAGUIRE PART No. | IRC PART No. |  |
| 19 | 1500Ω | ½ |  | BTS-1500 | Br.-Grn.-Red RF Plate Load |
| 20 | 470KΩ | ½ |  | BTS-470K | Yl.-Vi.-Yl. Converter Grid |
| 21 | 22KΩ | ½ |  | BTS-22KΩ | Red-Red-Or. Oscillator Grid |
| 22 | 220KΩ | ½ |  | BTS-220K | Red-Red-Yl. Line Isolation |
| 23 | 2.2 Meg. | ½ |  | BTS-2.2 Meg. | Red-Red-Grn. AVC Network |
| 24 | 10 Meg. | ½ |  | BTS-10 Meg. | Br.-Blk.-Blue AF Grid |
| 25 | 220KΩ | ½ |  | BTS-220K | Red-Red-Yl. AF Plate Load |
| 26 | 470KΩ | ½ |  | BTS-470K | Yl.-Vi.-Yl. Output Grid |
| 27 | 150Ω | ½ |  | BW-½-150 | Br.-Grn.-Br. Output Cathode |
| 28 | 27Ω | 2 |  | BW-2-27 | Red-Vi.-Blk. Pilot Light Shunt |
| 29 | 100Ω | 2 |  | BW-2-100 | Br.-Blk.-Br. Rectifier Ballast |
| 30 | 100Ω | 2 |  | BW-2-100 | Br.-Blk.-Br. Line Dropping |
| 31 | 1500Ω | 2 |  | BT-2-1500 | Br.-Grn.-Red Filter |

## TRANSFORMER (OUTPUT)

| ITEM No. | RATING |  |  |  | REPLACEMENT DATA |  |  |  | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|---|
|  | IMPEDANCE |  | DC RES. |  |  |  |  |  |  |
|  | PRI. | SEC. | PRI. | SEC. | MAGUIRE PART No. | STANCOR PART No. | THORDAR'N PART No. |  |  |
| 32 | 1350Ω | 2.8Ω | 200Ω | .42Ω | B-20371 | A-3876* | T22S45* |  | *Bend mounting tabs down, file out slots and mount on original bracket. |

# CHASSIS—TOP VIEW



# PARTS LIST AND DESCRIPTIONS (Continued)

## SPEAKER

| ITEM No. | RATINGS | | REPLACEMENT DATA MAGUIRE PART No. | JENSEN PART No. | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|
| 33 | FIELD<br>PM | VC IMP.<br>2.8Ω | 6-20354-1 | ST-113†<br>Mod. P4-X | | †Fabricate new mounting bracket. |
| 34 | CONE DIA.<br>4" | VC DIA.<br>½" | NOT READILY REPLACEABLE-USE COMPLETE UNIT. | | | |

## R F COILS

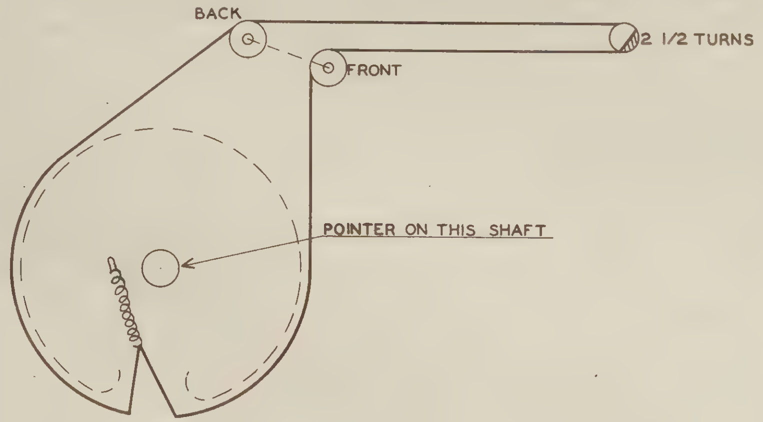
| ITEM No. | USE | DC RES. | | REPLACEMENT DATA | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|
| | | PRI. | SEC. | MAGUIRE PART No. | MEISSNER PART No. | |
| 35 | Loop Ant. | 0Ω | 1Ω | B14123 | | |
| 36 | Osc. Coil | | 5.5Ω | 03963 | 14-1040 | |
| 37 | Input IF | 23.8Ω | 23.8Ω | 03964 | 16-6658 | |
| 38 | Output IF | 21Ω | | 05143 | 16-6670 | |

## DIAL LIGHT

| ITEM No. | BASE TYPE | VOLTS | AMPS. | BEAD COLOR | REPLACEMENT DATA MAGUIRE PART No. | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|
| 39 | Bayonet | 6-8 | 0.15 | Brown | | | Type 47 |

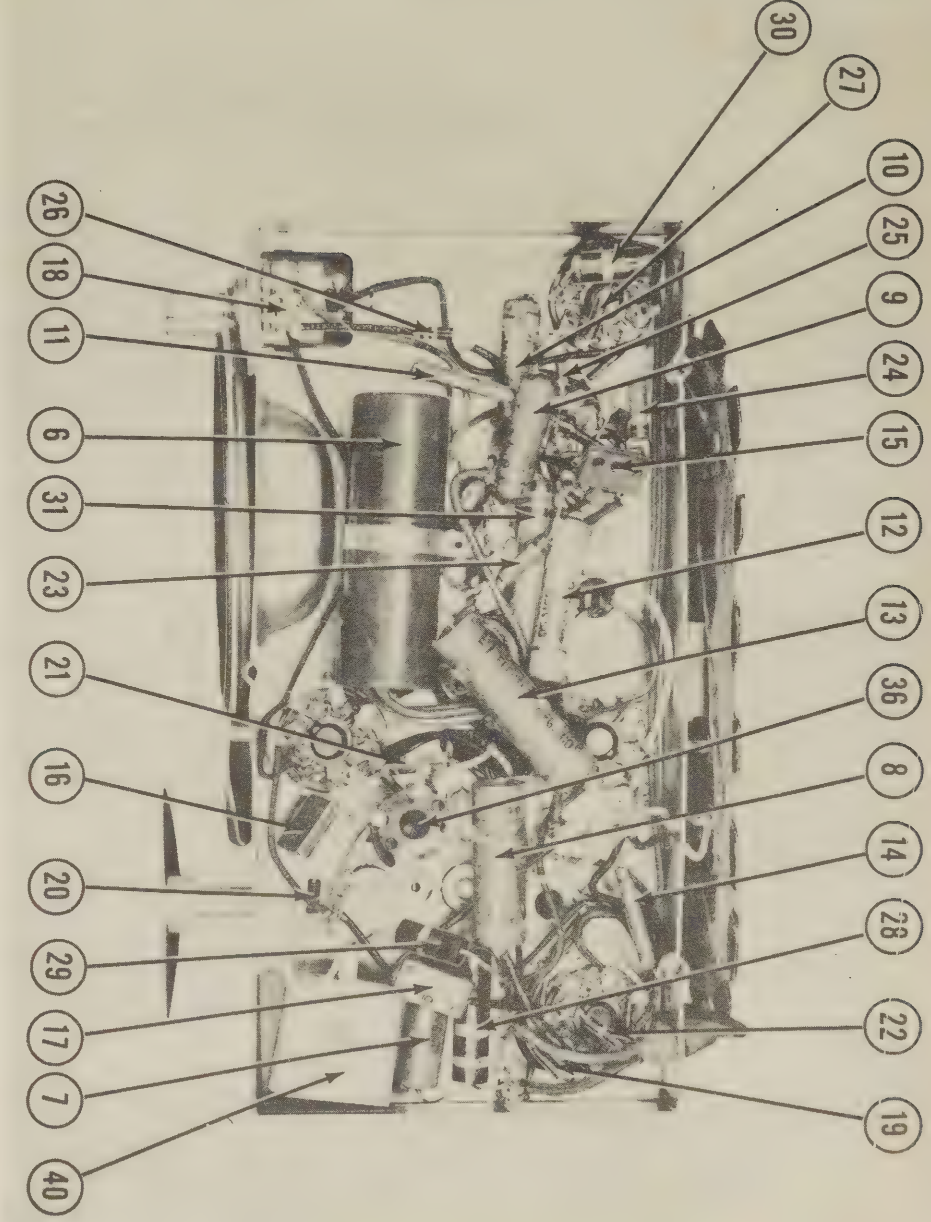
## MISCELLANEOUS

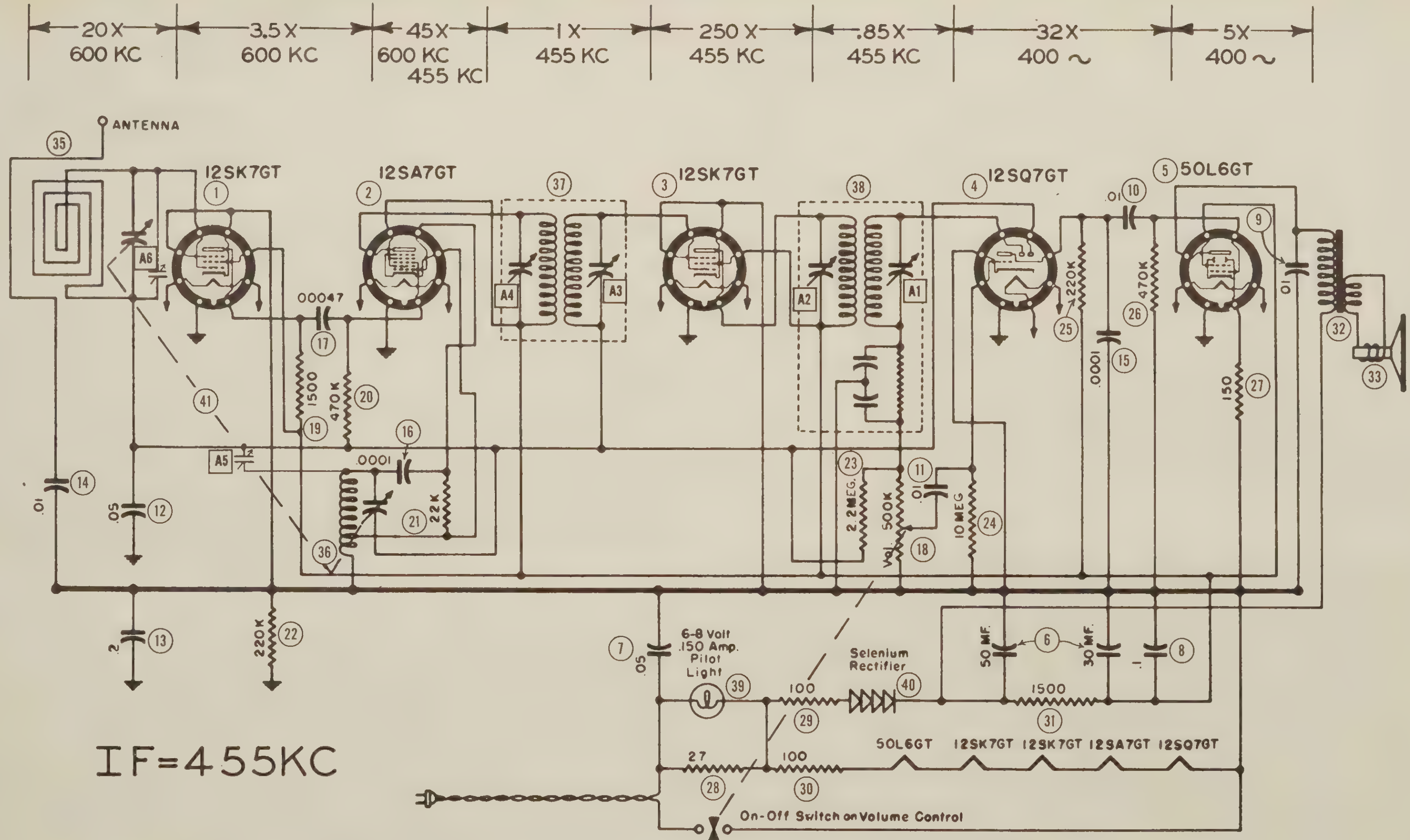
| ITEM No. | PART NAME | MAGUIRE PART No. | NOTES |
|---|---|---|---|
| 40 | Selenium Rect. | 29375 | |
| 41 | 2 Gang Var. Cap. | | (41-465 MMF, 35-202 MMF)<br>Trimmers Part of Assby. |



DIAL CORD DRIVE

## CHASSIS—BOTTOM VIEW





VOLTAGE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 12SK7GT | 0V. | 46V.AC | 0V. | -.4V.DC | 0V. | 70V.DC | 34V.AC | 60V.DC |
| 2 | 12SA7GT | 0V. | 23V.AC | 70V.DC | 70V.DC | -3.7V.DC | 0V. | 11V.AC | -.4V.DC |
| 3 | 12SK7GT | 0V. | 34V.AC | 0V. | -.4V.DC | 0V. | 70V.DC | 23V.AC | 70V.DC |
| 4 | 12SQ7GT | 0V. | -.6V.DC | 0V. | -.2V.DC | -.4V.DC | 49V.DC | 11V.AC | 0V. |
| 5 | 50L6GT | 0V. | 97V.AC | 116V.DC | 70V.DC | 0V. | 113V.AC | 46V.AC | 4.5V.DC |

RESISTANCE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 12SK7GT | 190KΩ | 46Ω | 0Ω | 2.6MEG. | 0Ω | 150KΩ | 35Ω | 150KΩ |
| 2 | 12SA7GT | 190KΩ | 23Ω | 150KΩ | 150KΩ | 20KΩ | .5Ω | 12Ω | 3MEG. |
| 3 | 12SK7GT | 190KΩ | 35Ω | 0Ω | 2.6MEG. | 0Ω | 150KΩ | 23Ω | 150KΩ |
| 4 | 12SQ7GT | 190KΩ | 10MEG. | 0Ω | 410KΩ | 2.6MEG. | 370KΩ | 12Ω | 0Ω |
| 5 | 50L6GT | 190KΩ | 90Ω | 150KΩ | 150KΩ | 390KΩ | 190Ω | 46Ω | 150Ω |

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

472-18

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

PHOTOFACT* Folder

*TRADE MARK

# ROLAND MODEL
# 71-384 (W100)

| | |
|---|---|
| TRADE NAME | Roland Model 71-384 (W100) |
| MANUFACTURER | Roland Radio Corp., 2-30 Anderson Ave., Mount Vernon, N. Y. |
| TYPE SET | Three Power Portable BC-SW Receiver |
| TUBES (Five) | Types 1U4 RF Amplifier, 1L6 Converter, 1U4 IF Amplifier, 1U5 Det.-AVC-AF Amp., 3V4 Output |
| POWER SUPPLY | 105-125 Volts AC-DC (or) 7.5 Volts "A" Supply & 90 Volts "B" Supply in Pack Form |
| RATING | .16 Amp. @ 117 Volts AC (or) 46MA @ 7.5 Volts DC & 14MA @ 90 Volts DC |
| TUNING RANGE—BROADCAST | 540-1620KC SHORT WAVE 5.8 - 18.3MC |

## ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use battery power, if possible. If AC power is used, use an isolation transformer when available. If not, connect a .1mfd capacitor in series with low side of the signal generator and B-. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | OUTPUT METER | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 1. | .1mfd | High side to pin 6 (grid) of 1L6 (V2). Low side to B-. | 455KC (400∿ Mod) | BC | Tuning gang fully open | Across voice coil | A1, A2, A3, A4 | Adjust for maximum output. If AC power is used without an isolation transformer, reduce dummy antenna to 200mmf to reduce hum modulation. |
| | Set signal generator to 19.3MC for image frequency. If image fails to appear, set signal generator to 18.4MC. Decrease capacity of A5 until signal appears. Recheck for image. | | | | | | | |
| 2. | .1mfd | High side to pin 6 (grid) of 1L6 (V2). Low side to B-. | 18.4MC | SW | Tuning gang fully open | Across voice coil | A5 | Set A6 and A7 to maximum capacity. Adjust A5 for maximum output using peak signal obtained with screw farthest out. |
| 3. | | Loop | 17MC | " | 17MC | " | A6, A7 | Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output. |
| 4. | | " | 1620KC | BC | Tuning gang fully open | " | A8 | " |
| 5. | | " | 1400KC | " | 1400KC | " | A9, A10 | " |
| 6. | | " | 600KC | " | 600KC | " | A11 | Fashion loop of several turns of wire and radiate signal into loop of receiver while rocking tuning gang.<br>Repeat steps 4, 5 and 6. |

**HOWARD W. SAMS & CO., INC.** Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1959 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

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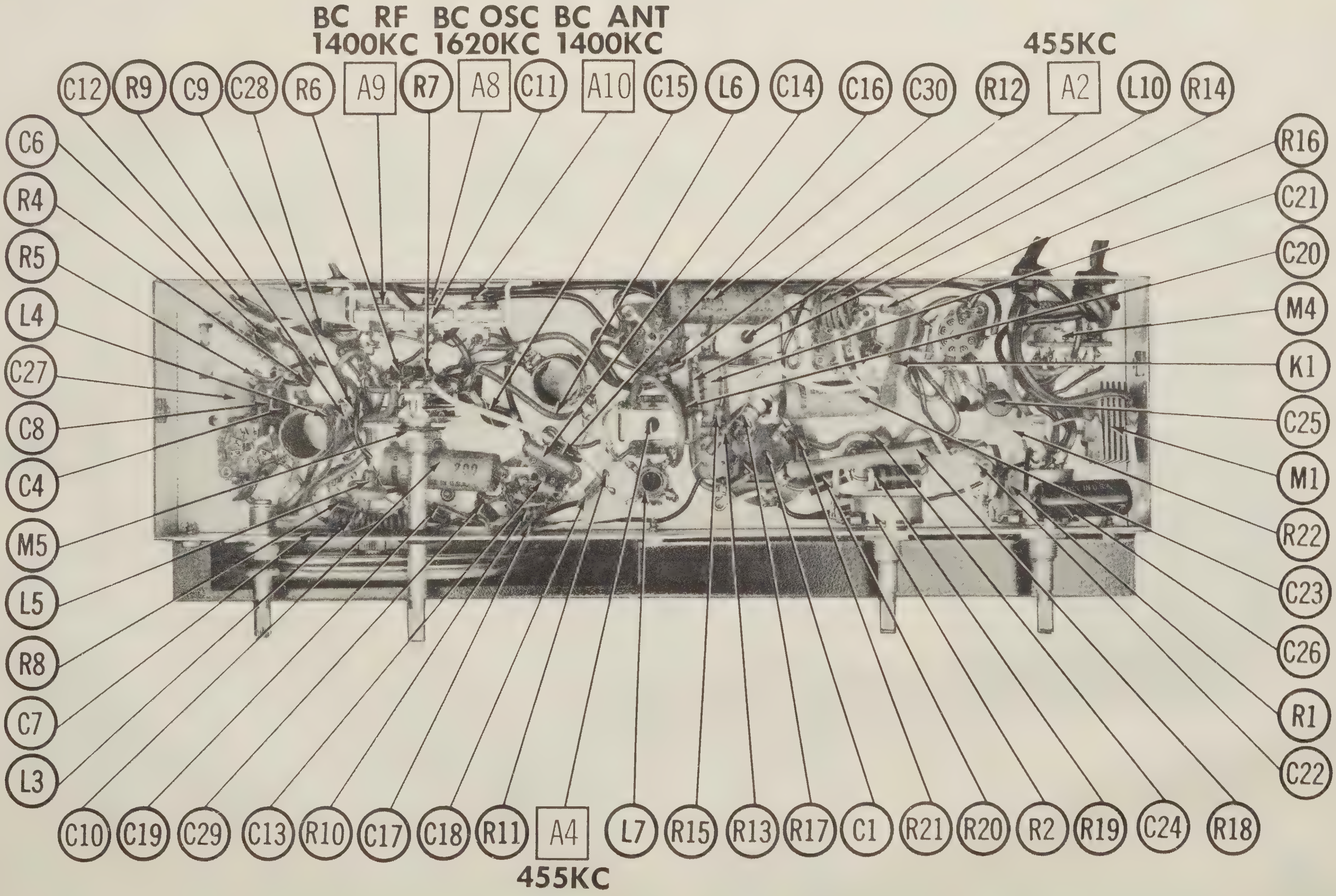
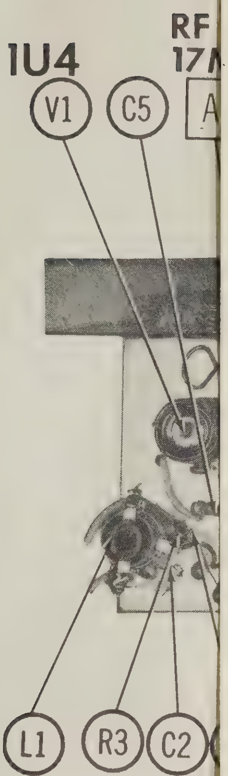


CHASSIS BOTTOM VIEW



## PARTS LIST AND DESCRIPTIONS

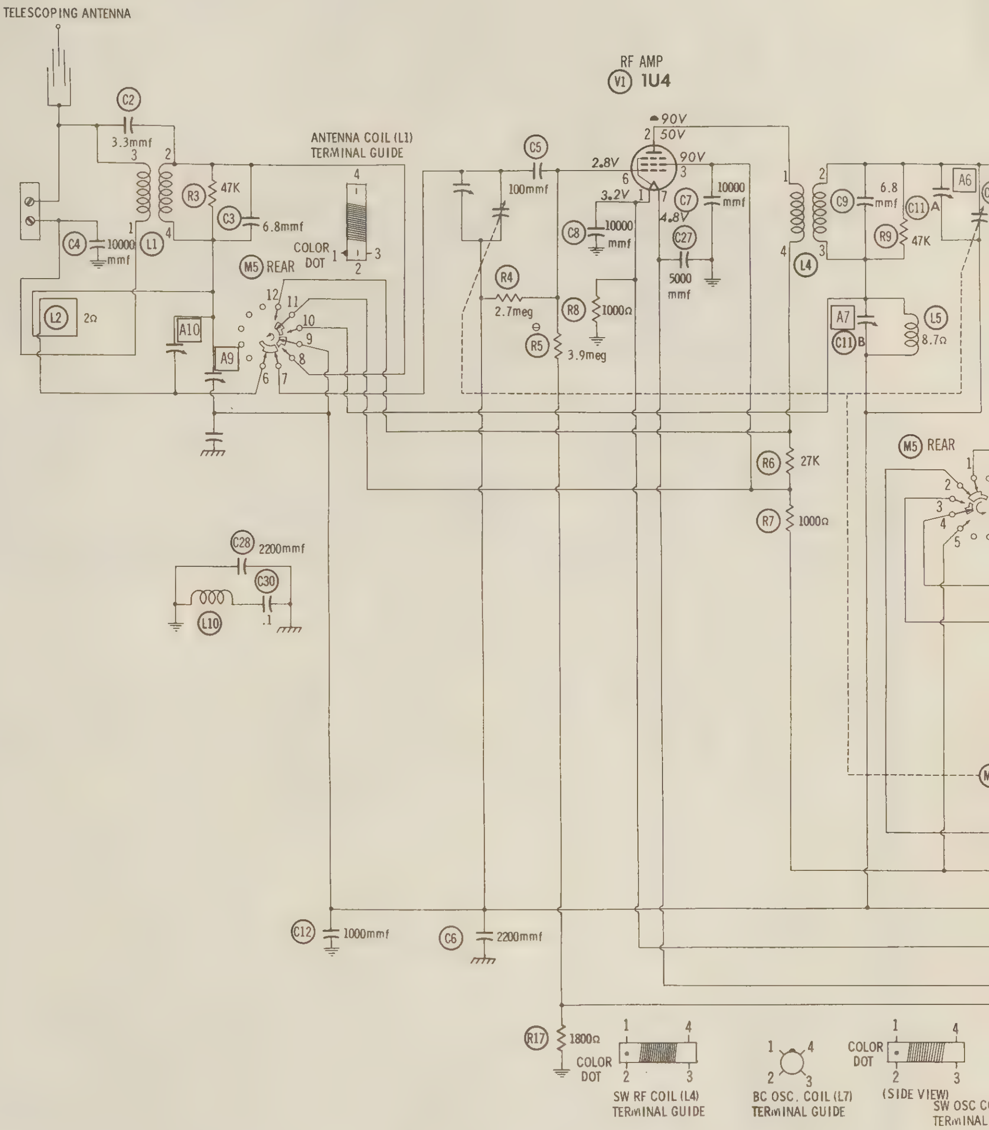
### TUBES (GENERAL ELECTRIC, SYLVANIA)

| ITEM No. | USE | TYPE | NOTES |
|---|---|---|---|
| V1 | RF Amp. | 1U4 | |
| V2 | Converter | 1L6 | |
| V3 | IF Amp. | 1U4 | |

| ITEM No. | USE | TYPE | NOTES |
|---|---|---|---|
| V4 | Det.-AVC-AF Amp. | 1U5 | |
| V5 | Output | 3V4 | |

### ELECTROLYTIC CAPACITORS

| ITEM | RATING | REPLACEMENT DATA |
|---|---|---|



NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

1. DC voltage measurements taken with vacuum tube voltmeter ; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum. no signal apllied for voltage measurements.

RESISTANCE READINGS

| ITEM | TUBE | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 |
|---|---|---|---|---|---|---|---|---|
| V1 | 1U4 | • | † 28K | † 1800Ω | NC | • | 1.6meg | • |
| V2 | 1L6 | • | † 800Ω | † 800Ω | 180K | † 69K | 19Ω | • |
| V3 | 1U4 | • | † 600Ω | † 600Ω | NC | • | 6.8meg | • |
| V4 | 1U5 | • | † 1meg | † 4.7meg | 650K | • | 10meg | • |
| V5 | 3V4 | • | † 1000Ω | † 600Ω | NC | • | 3.3meg | • |

ALL MEASUREMENTS TAKEN IN "BROADCAST" POSITION UNLESS OTHERWISE DESIGNATED.

• DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE.

† MEASURED FROM OUTPUT OF M1.

▲ MEASURED IN "SHORT WAVE" POSITION.

NC NO CONNECTION.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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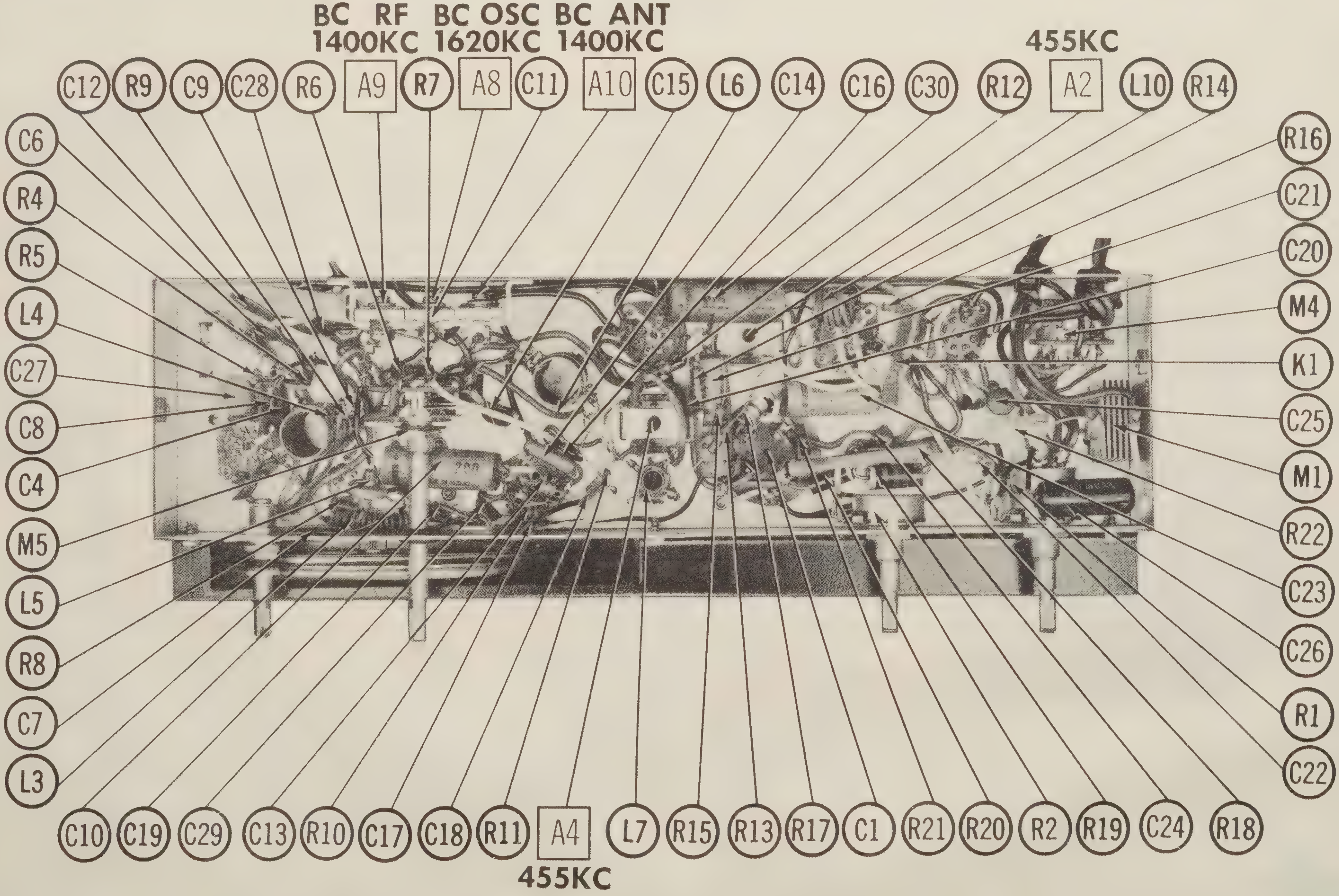
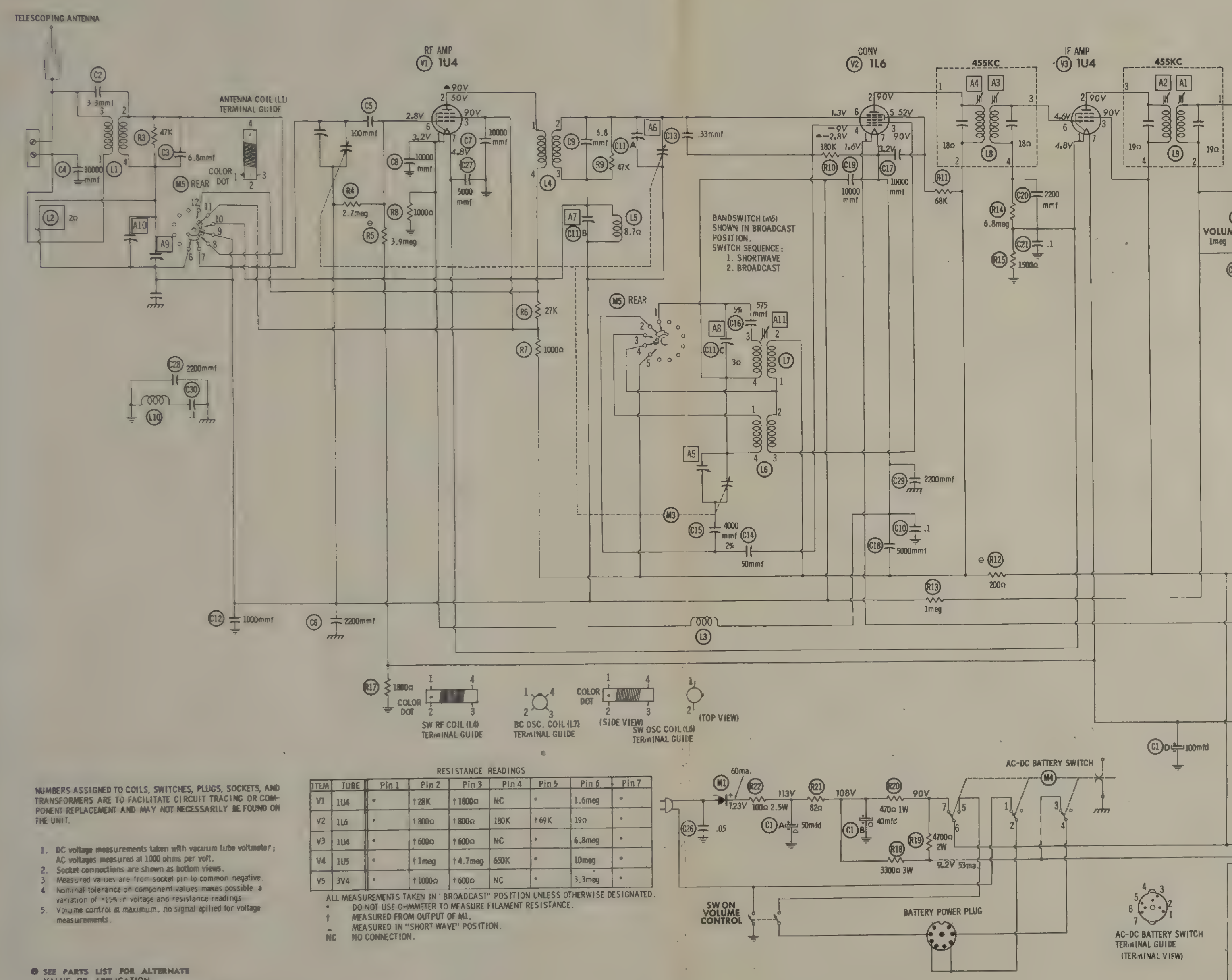


CHASSIS BOTTOM VIEW


TELESCOPING ANTENNA
RF AMP V1 1U4
CONV V2 1L6
IF AMP V3 1U4
DET-AVC-AF AMP V4 1U5
455KC
ANTENNA COIL (L1) TERMINAL GUIDE
COLOR DOT
REAR
BANDSWITCH (M5) SHOWN IN BROADCAST POSITION. SWITCH SEQUENCE: 1. SHORTWAVE 2. BROADCAST
TONE 2meg
VOLUME 1meg WITH 50K STOP
OUTPUT V5 3V4
BLUE
YEL
RED
SW RF COIL (L4) TERMINAL GUIDE
BC OSC. COIL (L7) TERMINAL GUIDE
(SIDE VIEW)
SW OSC COIL (L6) TERMINAL GUIDE
(TOP VIEW)
AC-DC BATTERY SWITCH
SW ON VOLUME CONTROL
BATTERY POWER PLUG
AC-DC BATTERY SWITCH TERMINAL GUIDE (TERMINAL VIEW)

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal aplied for voltage measurements.

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

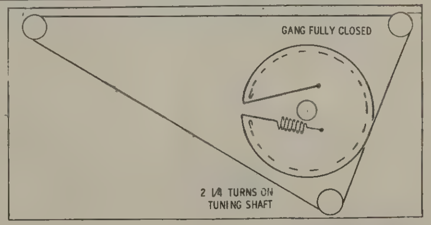
A PHOTOFACT STANDARD NOTATION SCHEMATIC
© Howard W. Sams & Co., Inc. 1959

RESISTANCE READINGS

| ITEM | TUBE | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 |
|---|---|---|---|---|---|---|---|---|
| V1 | 1U4 | • | † 28K | † 1800Ω | NC | • | 1.6meg | • |
| V2 | 1L6 | • | † 800Ω | † 800Ω | 180K | † 69K | 19Ω | • |
| V3 | 1U4 | • | † 600Ω | † 600Ω | NC | • | 6.8meg | • |
| V4 | 1U5 | • | † 1meg | † 4.7meg | 650K | • | 10meg | • |
| V5 | 3V4 | • | † 1000Ω | † 600Ω | NC | • | 3.3meg | • |

ALL MEASUREMENTS TAKEN IN "BROADCAST" POSITION UNLESS OTHERWISE DESIGNATED.
• DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE.
† MEASURED FROM OUTPUT OF M1.
▲ MEASURED IN "SHORT WAVE" POSITION.
NC NO CONNECTION.

## DIAL CORD STRINGING



ROLAND MODEL
71-384 (W100)

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PHOTOFACT* Folder

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ROLAND MODEL
71-384 (W100)

| | |
|---|---|
| TRADE NAME | Roland Model 71-384 (W100) |
| MANUFACTURER | Roland Radio Corp., 2-30 Anderson Ave., Mount Vernon, N. Y. |
| TYPE SET | Three Power Portable BC-SW Receiver |
| TUBES (Five) | Types 1U4 RF Amplifier, 1L6 Converter, 1U4 IF Amplifier, 1U5 Det.-AVC-AF Amp., 3V4 Output |
| POWER SUPPLY | 105-125 Volts AC-DC (or) 7.5 Volts "A" Supply & 90 Volts "B" Supply in Pack Form |
| RATING | .16 Amp. @ 117 Volts AC (or) 46MA @ 7.5 Volts DC & 14MA @ 90 Volts DC |
| TUNING RANGE—BROADCAST | 540-1620KC SHORT WAVE 5.8 - 18.3 MC |

# ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use battery power, if possible. If AC power is used, use an isolation transformer when available. If not, connect a .1mfd capacitor in series with low side of the signal generator and B-.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | OUTPUT METER | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 1. | .1mfd | High side to pin 6 (grid) of 1L6 (V2). Low side to B-. | 455KC (400~ Mod) | BC | Tuning gang fully open | Across voice coil | A1, A2, A3, A4 | Adjust for maximum output. If AC power is used without an isolation transformer, reduce dummy antenna to 200mmf to reduce hum modulation. |
| | Set signal generator to 19.3MC for image frequency. If image fails to appear, set signal generator to 18.4MC. Decrease capacity of A5 until signal appears. Recheck for image. | | | | | | | |
| 2. | .1mfd | High side to pin 6 (grid) of 1L6 (V2). Low side to B-. | 18.4MC | SW | Tuning gang fully open | Across voice coil | A5 | Set A6 and A7 to maximum capacity. Adjust A5 for maximum output using peak signal obtained with screw farthest out. |
| 3. | | Loop | 17MC | " | 17MC | " | A6, A7 | Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output. |
| 4. | | " | 1620KC | BC | Tuning gang fully open | " | A8 | " |
| 5. | | " | 1400KC | " | 1400KC | " | A9, A10 | " |
| 6. | | " | 600KC | " | 600KC | " | A11 | Fashion loop of several turns of wire and radiate signal into loop of receiver while rocking tuning gang.<br>Repeat steps 4, 5 and 6. |

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The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1959 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

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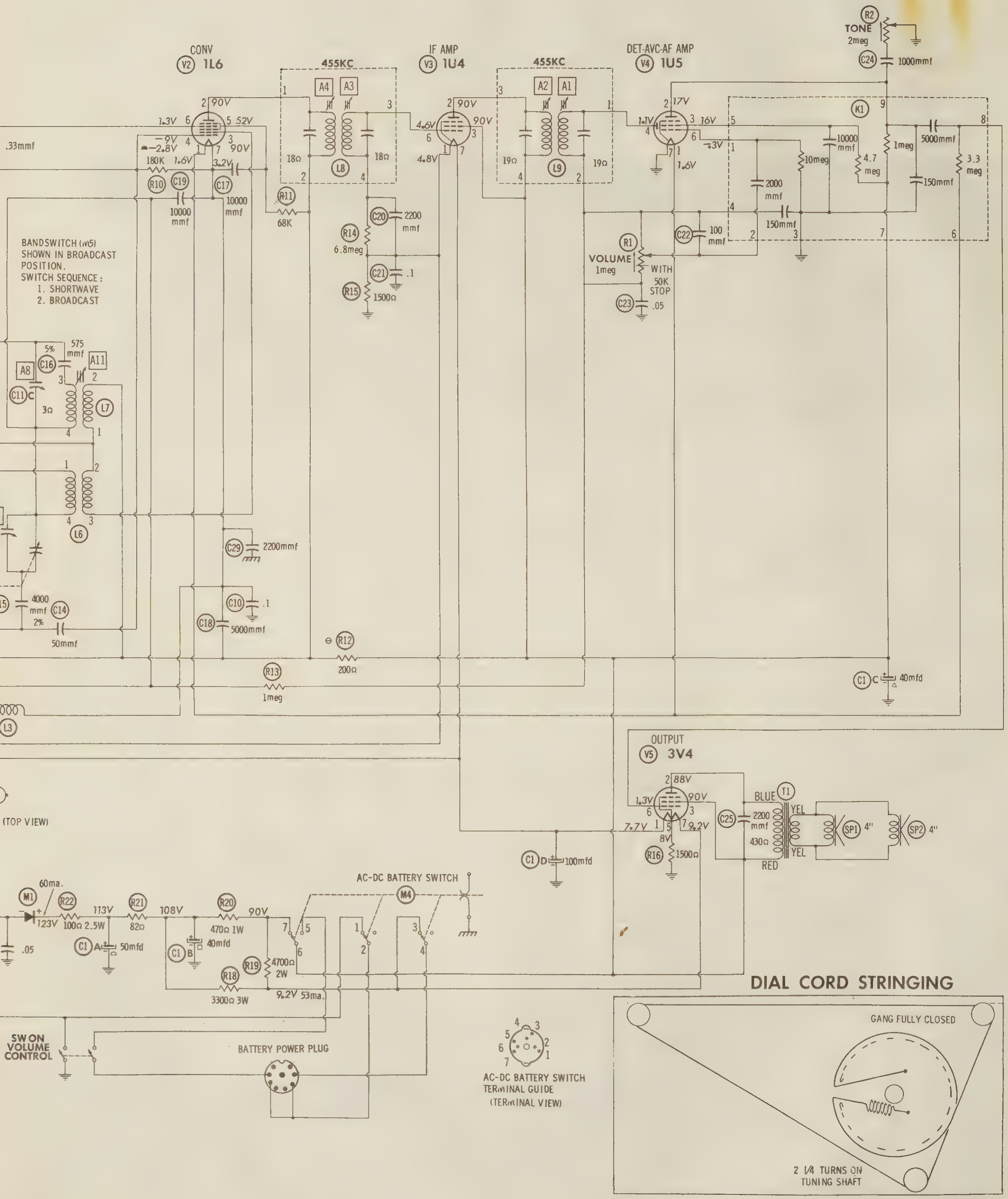
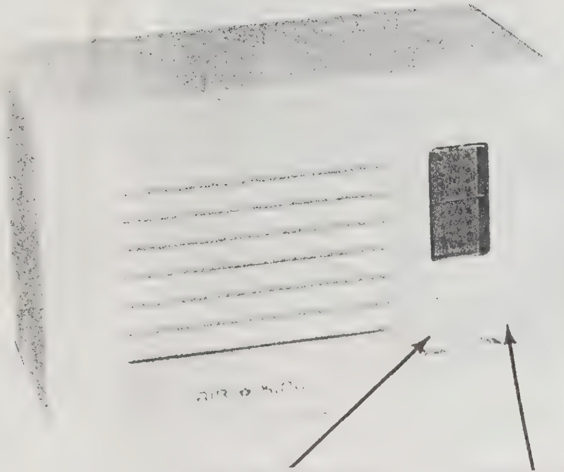
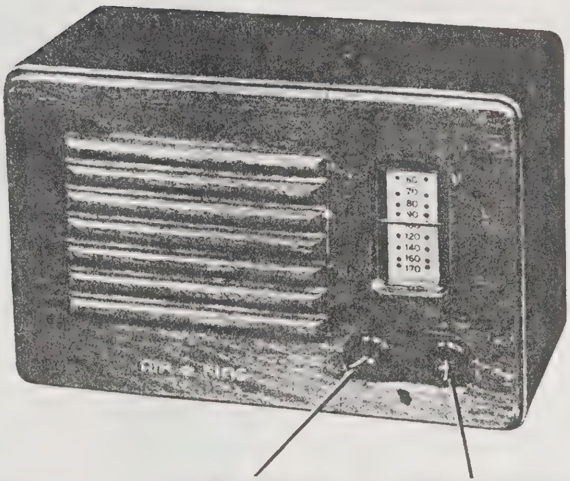


**ROLAND MODEL**
**71-384 (W100)**



MODEL 4610



MODEL 4609

AIR KING MODELS 4609, 4610

| | |
|---|---|
| **TRADE NAME** | Air King, Models 4609, 4610 |
| **MANUFACTURER** | Air King Products Co., Inc., 1523 63rd St., Brooklyn, N.Y. |
| **TYPE SET** | AC-DC Operated Superheterodyne Receiver |
| **TUBES** (FIVE) | Types, 12SA7GT Converter, 12SK7GT IF Amp., 12SQ7GT Det.-AVC-AF, 50L6GT Power Output, 35Z5GT Rectifier. |
| **POWER SUPPLY** | 105-125 Volts AC-DC |
| **TUNING RANGE—BROADCAST** | 540-1720KC RATING .225 Amp. @ 117 Volts AC |

**ALIGNMENT INSTRUCTIONS**

Use isolation transformer if available. If not, connect capacitor in series with the low side of the signal generator and chassis. Set volume control at maximum volume and keep input from signal generator no higher than is necessary to obtain output reading. Use insulated alignment screwdriver for adjusting.

| DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | RADIO DIAL SETTING | OUTPUT METER | ADJUST | REMARKS |
|---|---|---|---|---|---|---|
| .05 MFD. | High side to stator of rear section of variable. Low side to chassis. | 455KC | High freq. end. | Across voice coil | A1,A2, A3,A4. | Adjust for maximum output. If isolation trans. is not used, reduce dummy ant. to .001 MFD. to reduce hum modulation. |
| 200 MFD. | High side to ext. ant. Low side to chassis. | 1600KC | 1600KC | " | A5 | Adjust for maximum output. |
| 200 MFD. | " | 1400KC | Tune for maximum output. | " | A6 | " " " " |

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# PARTS LIST AND DESCRIPTIONS

## TUBES

| ITEM No. | USE | REPLACEMENT DATA | | RMA BASE TYPE | INSTALLATION NOTES |
|---|---|---|---|---|---|
| | | AIR KING PART No. | STANDARD REPLACEMENT | | |
| 1 | Converter | 12SA7GT | 12SA7GT | 8AD | |
| 2 | IF Amp. | 12SK7GT | 12SK7GT | 8N | |
| 3 | Det.-AVC-AF | 12SQ7GT | 12SQ7GT | 8Q | |
| 4 | Power Output | 50L6GT | 50L6GT | 7AC | |
| 5 | Rectifier | 35Z5GT | 35Z5GT | 6AD | |

## CAPACITORS

**Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | | IDENTIFICATION CODES AND INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|---|
| | CAP. | VOLT | AIR KING PART No. | SOLAR PART No. | SPRAGUE PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | |
| 6A | 40 | 150 | 2068 | M-2x40-150 | TA-440 | PRSA150-40-40 | BRD4415 | 2N511 | Filter - Red |
| B | 40 | 150 | | | | | | | " - Blue |
| 7 | .05 | 400 | | S-4-05 | TC-15 | 484-05 | DT4S5 | TP426 | Line Filter |
| 8 | .01 | 400 | | S-4-01 | TC-11 | 484-01 | DT4S1 | TP421 | Output Plate Bypass |
| 9 | .02 | 400 | | S-4-02 | TC-12 | 484-02 | DT4S2 | TP423 | Audio Coupling |
| 10 | .002 | 600 | | S-6-002 | TC-22 | 684-002 | DT6D2 | TP405 | " " |
| 11 | .05 | 400 | | S-4-05 | TC-15 | 484-05 | DT4S5 | TP426 | RF Bypass Pwr. Supp. |
| 12 | .05 | 400 | | S-4-05 | TC-15 | 484-05 | DT4S5 | TP426 | AVC Filter |
| 13 | .001 | 600 | | S-6-001 | TC-21 | 684-001 | DT6D1 | TP404 | Audio Plate Bypass |
| 14 | .005 | 400 | | S-6-004 | TC-25 | 484-005 | DT6D5 | TP408 | Ant. Coupling |
| 15 | 220 | 500 | | M0.5-32 | 1FM-32 | 1468-0002 | 5W5T2 | MC237 | IF Bypass Vol. Cont. |
| 16 | 47 | 500 | | M0.5-45 | 1FM-45 | 1468-00005 | 5W5Q5 | MC225 | Osc. Grid Capacitor |

## CONTROLS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|
| | RESISTANCE | WATTS | AIR KING PART No. | MALLORY PART No. | IRC PART No. | CLAROSTAT PART No. | |
| 17A | 500KΩ | 1 | | MR48 | D13-133 | M-60-Z | Volume Control |
| B | Shaft | | | Not Req. | A | Not Req. | Attach to 17A per instructions |
| C | Switch | | | M26 | 41 | SW-A | " " " " " |

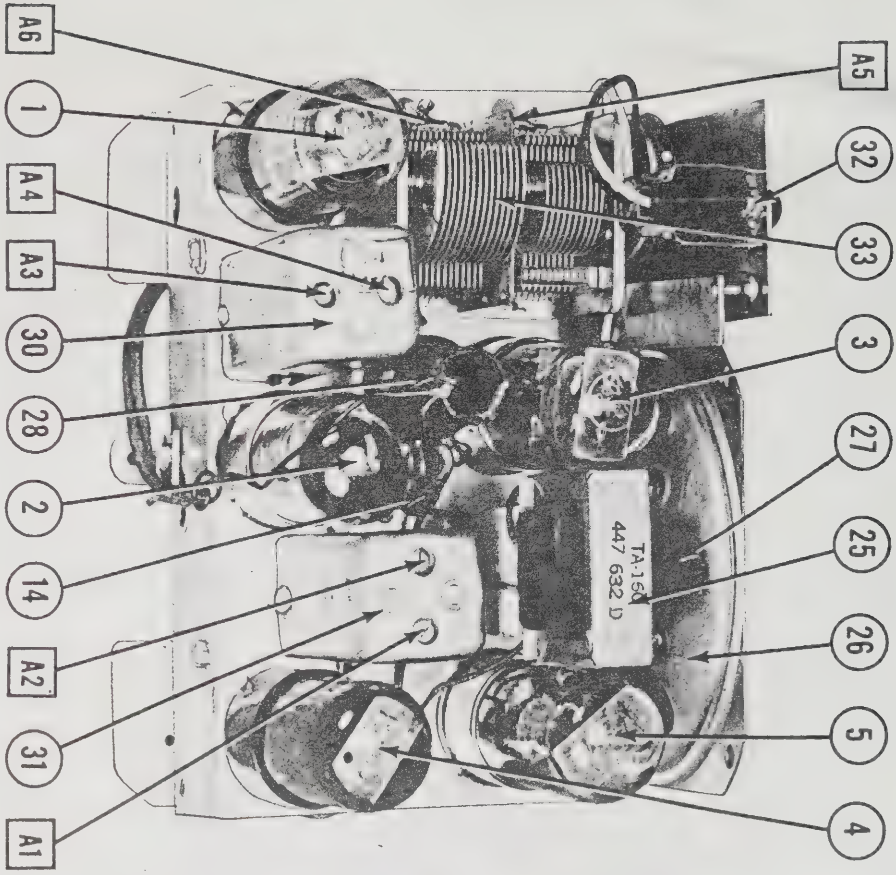
## RESISTORS

| ITEM No. | RATING | | REPLACEMENT DATA | | IDENTIFICATION CODES |
|---|---|---|---|---|---|
| | RESISTANCE | WATTS | AIR KING PART No. | IRC PART No. | |
| 18 | 15KΩ | ½ | | BTS-15K | Br.-Grn.-Or. Oscillator Grid |
| 19 | 2.2 Meg. | ½ | | BTS-2.2 Meg. | Red-Red-Grn. AVC Network |
| 20 | 4.7 Meg. | ½ | | BTS-4.7 Meg. | Yl.-Vl.-Grn. 1st AF Grid |
| 21 | 220KΩ | ½ | | BTS-220K | Red-Red-Yl. 1st AF Plate Load |
| 22 | 150KΩ | ½ | | BTS-150K | Br.-Grn.-Yl. Output Grid |
| 23 | 18Ω | ½ | | BW-½-18 | Br.-Gray-Blk. Rectifier Ballast |
| 24 | 2200Ω | 1 | | BTA-2200 | Red-Red-Red Filter |

## TRANSFORMER (OUTPUT)

| ITEM No. | RATING | | | | REPLACEMENT DATA | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|---|
| | IMPEDANCE | | DC RES. | | | | | | |
| | PRI. | SEC. | PRI. | SEC. | AIR KING PART No. | STANCOR PART No. | THORDAR'N PART No. | | |
| 25 | 2000Ω | 2.9Ω | 144Ω | .54Ω | Part of 5867 | A-3876‡ | T14S82‡ | | ‡Bend mounting tabs down, file slots and mount on original bracket. |

## CHASSIS—TOP VIEW



# PARTS LIST AND DESCRIPTIONS (Continued)

## SPEAKER

| ITEM No. | RATINGS | | REPLACEMENT DATA | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|
| | | | AIR KING PART No. | JENSEN PART No. | | |
| 26 | FIELD<br>PM | VC IMP.<br>2.9Ω | 5867 | ST-113<br>Mod. P4-X | | |
| 27 | CONE DIA.<br>3-15/16" | VC DIA.<br>1/2" | NOT READILY REPLACEABLE - USE COMPLETE SPEAKER UNIT. | | | |

## R F COILS

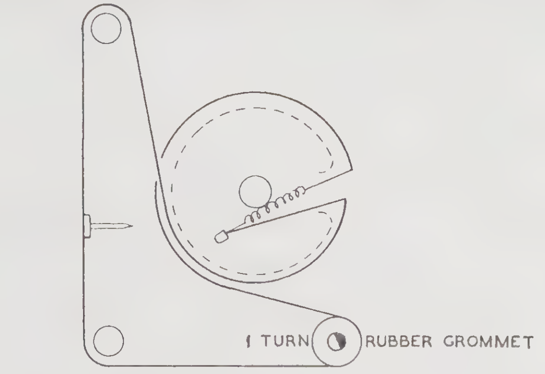
| ITEM No. | USE | DC RES. | | REPLACEMENT DATA | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|
| | | PRI. | SEC. | AIR KING PART No. | MEISSNER PART No. | |
| 28 | Ant. Coil | 60Ω | 5Ω | | | |
| 29 | Osc. Coil | 4.5Ω | | 28149-5 | 14-1040 | |
| 30 | Input IF | 11.5Ω | 13Ω | 3364-A | 16-6666 | |
| 31 | Output IF | 11.5Ω | 11.5Ω | 3365-A | 16-6667 | |

## DIAL LIGHT

| ITEM No. | BASE TYPE | VOLTS | AMPS. | BEAD COLOR | REPLACEMENT DATA | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|
| | | | | | AIR KING PART No. | | |
| 32 | Bayonet | 6-8 | 0.15 | brown | | | Type 47 |

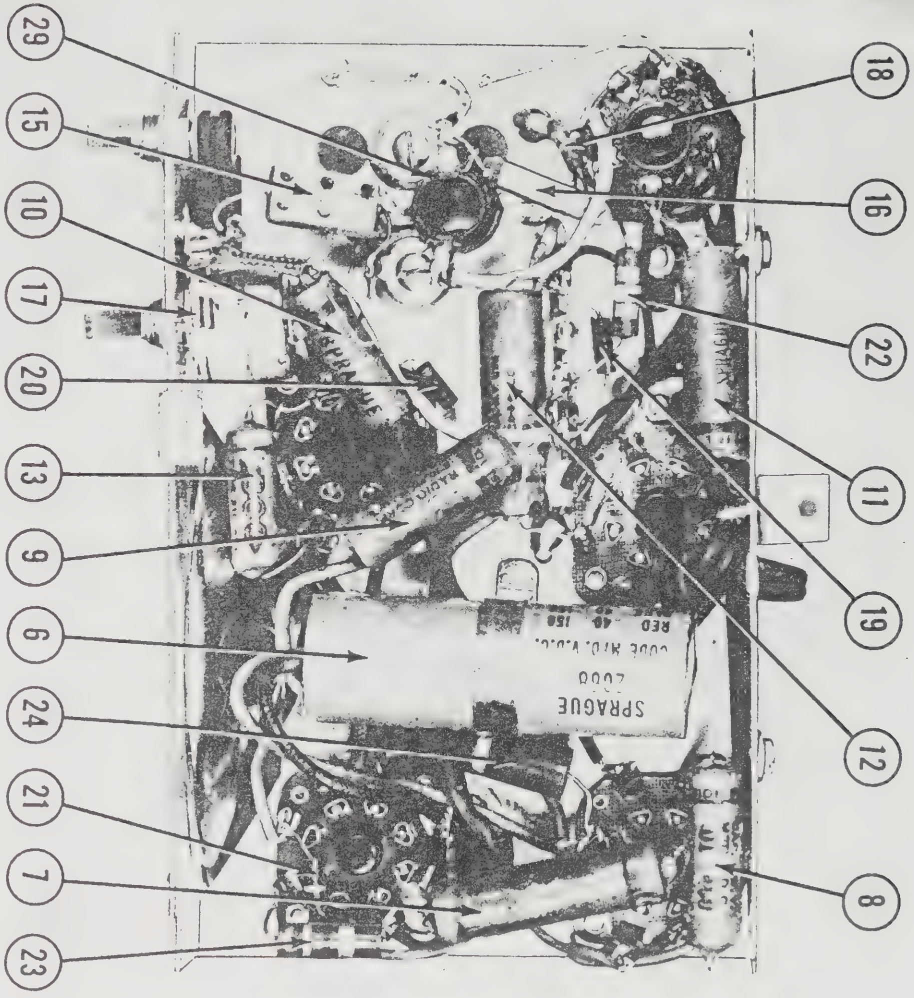
## MISCELLANEOUS

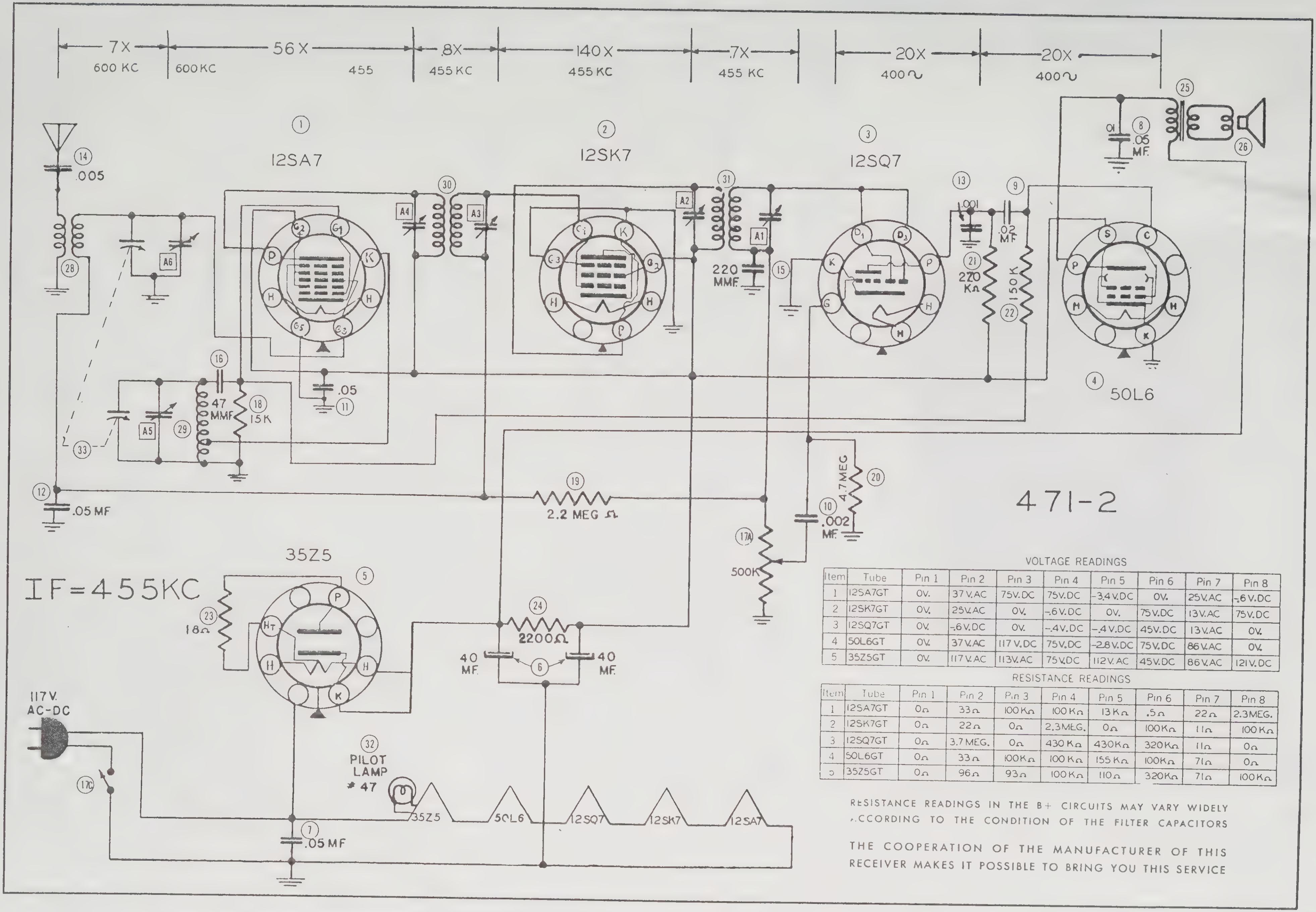
| ITEM No. | PART NAME | AIR KING PART No. | NOTES |
|---|---|---|---|
| 33 | 2 Gang Var. Cap. | 1662-D | Ant. & Osc. Trimmers Included |



DIAL CORD DRIVE

## CHASSIS—BOTTOM VIEW





IF=455KC

471-2

VOLTAGE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 12SA7GT | 0V. | 37 V.AC | 75V.DC | 75V.DC | -3.4 V.DC | 0V. | 25V.AC | -.6 V.DC |
| 2 | 12SK7GT | 0V. | 25V.AC | 0V. | -.6 V.DC | 0V. | 75 V.DC | 13V.AC | 75V.DC |
| 3 | 12SQ7GT | 0V. | -.6 V.DC | 0V. | -.4V.DC | -.4 V.DC | 45V.DC | 13V.AC | 0V. |
| 4 | 50L6GT | 0V. | 37 V.AC | 117 V.DC | 75V.DC | -2.8 V.DC | 75V.DC | 86 V.AC | 0V. |
| 5 | 35Z5GT | 0V. | 117 V.AC | 113V.AC | 75V.DC | 112V. AC | 45V.DC | 86 V.AC | 121V.DC |

RESISTANCE READINGS

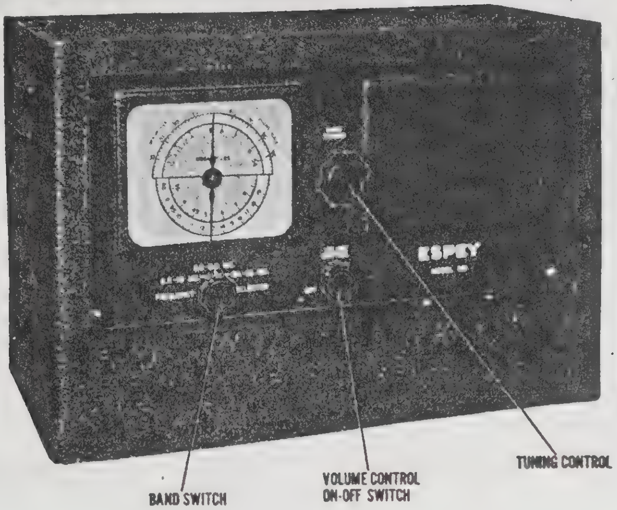
| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 12SA7GT | 0Ω | 33Ω | 100 KΩ | 100 KΩ | 13 KΩ | .5Ω | 22Ω | 2.3MEG. |
| 2 | 12SK7GT | 0Ω | 22Ω | 0Ω | 2.3MEG. | 0Ω | 100KΩ | 11Ω | 100 KΩ |
| 3 | 12SQ7GT | 0Ω | 3.7 MEG. | 0Ω | 430 KΩ | 430KΩ | 320KΩ | 11Ω | 0Ω |
| 4 | 50L6GT | 0Ω | 33Ω | 100KΩ | 100 KΩ | 155 KΩ | 100KΩ | 71Ω | 0Ω |
| 5 | 35Z5GT | 0Ω | 96Ω | 93Ω | 100 KΩ | 110Ω | 320KΩ | 71Ω | 100 KΩ |

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measure-



ESPEY MODEL 581

| | |
|---|---|
| **TRADE NAME** | Espey, Model 581 |
| **MANUFACTURER** | Espey Mfg. Co., 528 E. 72nd St., New York,21, N .Y. |
| **TYPE SET** | Three Power Multi-Band Superheterodyne Receiver |
| **TUBES** (EIGHT) | Types, 1LN5 RF Amp., 1LC6 Converter, 1LN5 1st IF Amp., 1LN5 2nd IF Amp., 1LH4 Det.-AVC-AF, 50A5 (AC Operation), 3LH4 or 3Q5GT (Batt. Operation) Power Output, 35Y4 Rectifier. |
| **POWER SUPPLY** | 105-125 Volts.AC-DC or 12 Volt "A" Battery & 90 Volt "B" Battery |
| RATING | .270 Amp. @ 117 Volts AC or 56 MA @ 13 Volts DC and 11.7 MA @ 92 Volts DC |
| **TUNING RANGE—BROADCAST** | 540-1700KC **SHORT WAVE** 3.85-8.5MC, 8.5-19.5MC |

### ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn variable fully closed and set pointer parallel with horizontal line in center of dial. Use battery power when available. When using a-c power use isolation transformer if available. If not, connect a capacitor in series with low side of signal generator and chassis. Volume control should be at maximum volume and output of signal generator no higher than necessary to obtain output reading. Use insulated alignment screwdriver for adjusting.

| DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | OUTPUT METER | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|
| .1 MFD. | High side to center stator of variable. Low side to B-. | 455KC | B1 | Variable fully open. | Across voice coil | A1,A2, A3,A4. | Adjust for maximum output. If a-c power is used without an isolation transformer, reduce dummy ant. to .001 MFD. to reduce hum modulation. |
| 200MMFD | High side to ant. terminal. Low side to chassis. | 1600KC | " | 1600KC | " | A5 | Adjust for maximum output |
| 200MMFD | " | 1400KC | " | Tune for maximum output. | " | A6,A7 | " " " " |
| 200MMFD | " | 600KC | " | " | " | A8 | Rock variable and adjust for maximum output. Repeat last three steps. |
| 400Ω | " | 8MC | B2 | 8MC | " | A9 | Adjust for maximum output. |
| 400Ω | " | " | " | Tune for max maximum output. | " | A10,A11 | " |
| 400Ω | " | 5MC | " | " | " | A12 | Rock variable and adjust for maximum output. Repeat adjustments of A9, A10, A11. |
| 400Ω | " | 19MC | B3 | 19MC | " | A13 | Adjust for maximum output. |
| 400Ω | " | " | " | Tune for maximum output. | " | A14,A15 | " " " " |
| 400Ω | " | 10MC | " | " | " | A16 | Rock variable and adjust for maximum output. Repeat adjustments of A13, A14, A15. |

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# PARTS LIST AND DESCRIPTIONS

## TUBES

| ITEM No. | USE | REPLACEMENT DATA |  | RMA BASE TYPE | INSTALLATION NOTES |
|---|---|---|---|---|---|
|  |  | ESPEY PART No. | STANDARD REPLACEMENT |  |  |
| 1 | RF Amp. | 1LN5 | 1LN5 | 7AO |  |
| 2 | Converter | 1LC6 | 1LC6 | 7AK |  |
| 3 | 1st IF Amp. | 1LN5 | 1LN5 | 7AO |  |
| 4 | 2nd IF Amp. | 1LN5 | 1LN5 | 7AO |  |
| 5 | 2nd Det.-Audio | 1LH4 | 1LH4 | 5AG |  |
| 6 | Power Output | 50A5 | 50A5 | 6AA |  |
| 7 | Rectifier | 35Y4 | 35Y4 | 5AL |  |
| 8A | Output (Batt.) | 3LH4 | 3LH4 |  |  |
| 8B | Output (Batt.) | 3Q5GT | 3Q5GT | 7AP |  |

## CAPACITORS

**Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

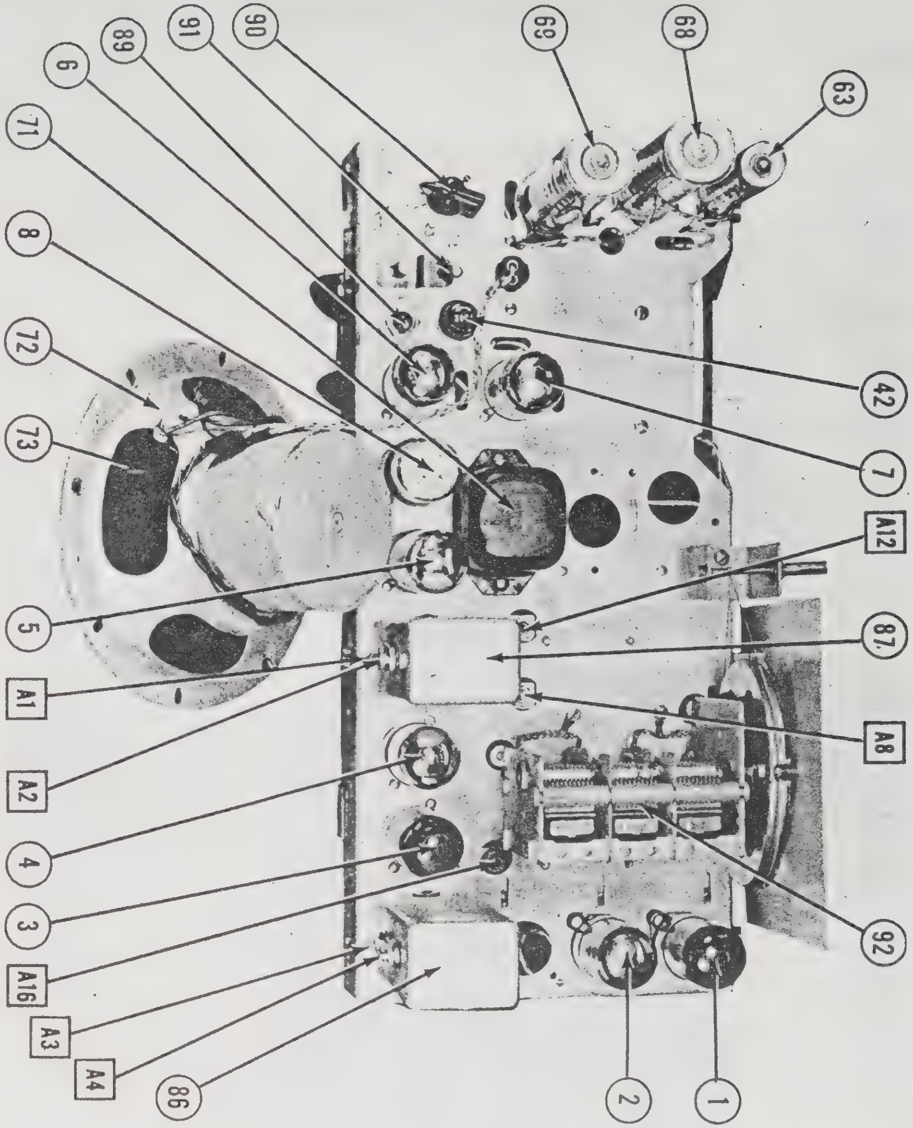
| ITEM No. | RATING |  | REPLACEMENT DATA |  |  |  |  |  | IDENTIFICATION CODES AND INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|---|
|  | CAP. | VOLT | ESPEY PART No. | SPRAGUE PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | SOLAR PART No. |  |
| 9 | 80 | 150 |  | TA-440† | PRSA150-40-40† | BRD4415† | 2N511† | DSB-2x40-150† | Filter |
| 10A | 40 | 150 |  | TA-440 | PRSA150-40-40 | BRD4415 | 2N511 | DSB-2x40-150 | " - Red |
| B | 40 | 150 |  |  |  |  |  |  | " - " |
| 11 | 1000 | 15 |  | UHC-1015 | HCLV18-1000 | FA1510 | HC1520 | DZ-1000-15 | Filament Bypass |
| 12 | .01 | 600 |  | TC-11 | 684-01 | DT6S1 | TP410 | S-6-01 | Output Plate Bypass |
| 13 | .006 | 600 |  | TC-26 | 684-006 | DT6D6 | TP409 | S-6-006 | Audio Coupling |
| 14 | .1 | 400 |  | TC-1 | 484-.1 | DT4P1 | TP428 | S-4-1 | Audio Plate Decoup. |
| 15 | .006 | 600 |  | TC-26 | 684-006 | DT6D6 | TP409 | S-6-006 | Audio Coupling |
| 16 | .006 | 600 |  | TC-26 | 684-006 | DT6D6 | TP409 | S-6-006 | " " |
| 17 | .001 | 400 |  | TC-21 | 484-001 | DT6D1 | TP404 | S-6-001 | 2nd IF Plate Decoup. |
| 18 | .1 | 400 |  | TC-1 | 484-.1 | DT4P1 | TP428 | S-4-1 | 2nd IF Fil. Bypass |
| 19 | .02 | 200 |  | TC-12 | 484-02 | DT4S2 | TP423 | S-4-02 | 1st IF Grid Filter |
| 20 | .02 | 200 |  | TC-12 | 484-02 | DT4S2 | TP423 | S-4-02 | Conv. Screen Bypass |
| 21 | .05 | 400 |  | TC-15 | 484-05 | DT4S5 | TP426 | S-4-05 | Conv. Plate Decoup. |
| 22 | .1 | 400 |  | TC-1 | 484-.1 | DT4P1 | TP428 | S-4-1 | Conv. Fil. Bypass |
| 23 | .1 | 400 |  | TC-1 | 484-.1 | DT4P1 | TP428 | S-4-1 | " " " |
| 24 | .05 | 200 |  | TC-15 | 484-05 | DT4S5 | TP426 | S-4-05 | AVC Filter |
| 25 | .1 | 400 |  | TC-1 | 484-.1 | DT4P1 | TP428 | S-4-1 | RF Fil. Bypass |
| 26 | .01 | 200 |  | TC-11 | 484-01 | DT4S1 | TP421 | S-4-01 | AVC Filter |
| 27 | .006 | 600 |  | TC-26 | 684-006 | DT6D6 | TP409 | S-6-006 | Ext. Gnd. Isolation |
| 28 | .005 | 400 |  | TC-25 | 484-005 | DT6D5 | TP408 | S-6-005 | Line Filter |
| 29 | .1 | 400 |  | TC-1 | 484-.1 | DT4P1 | TP428 | S-4-1 | RF Bypass Pwr. Supp.* |
| 30 | .1 | 400 |  | TC-1 | 484-.1 | DT4P1 | TP428 | S-4-1 | " " " " * |
| 31 | 15 | 300 |  |  |  |  |  |  | RF Coupling Cer. |
| 32 | 100 | 500 |  | 1FM-31 | 1468-0001 | 5W5T1 | MC235 | M0.5-31 | Audio Plate Bypass |
| 33 | 100 | 500 |  | 1FM-31 | 1468-0001 | 5W5T1 | MC235 | M0.5-31 | Diode Filter |
| 34 | 100 | 500 |  | 1FM-31 | 1468-0001 | 5W5T1 | MC235 | M0.5-31 | " " |
| 35 | 220 | 500 |  | 1FM-32 | 1468-0002 | 5W5T2 | MC237 | M0.5-32 | IF Coupling |
| 36 | 2200 | 500 |  | 1FM-22 | 1467-002 | 1W5D2 | MC457 | MW.5-22 | Osc. Anode Coupling |
| 37 | 100 | 500 |  | 1FM-31 | 1468-0001 | 5W5T1 | MC235 | M0.5-31 | Osc. Grid Capacitor |
| 38 | 430 | 500 |  |  |  |  |  |  | Fixed Padder |
| 39 | 2200 | 500 |  |  |  |  |  |  | " " |
| 40 | 4300 | 500 |  |  |  |  |  |  | " " |

†Parallel for 80 MFD.
*Not used in all models.

## CONTROLS

| ITEM No. | RATING |  | REPLACEMENT DATA |  |  |  | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|
|  | RESISTANCE | WATTS | ESPEY PART No. | MALLORY PART No. | IRC PART No. | CLAROSTAT PART No. |  |
| 41A | 1 Meg. | 1 |  | MK53 | D13-137 | M-53-Z | Volume Control |
| B | Shaft |  |  | Not Req. | A | Not Req. | Attach to 42A per instructions |
| C | Switch |  |  | M27 | 42 | SW-A2 | " " " " " |

# CHASSIS—TOP VIEW



# PARTS LIST AND DESCRIPTIONS (Continued)

## RESISTORS

| ITEM No. | RATING | | REPLACEMENT DATA | | IDENTIFICATION CODES |
|---|---|---|---|---|---|
| | RESISTANCE | WATTS | ESPEY PART No. | IRC PART No. | |
| 43 | 270Ω | ¼ | | BW-½-270 | Red-Vi.-Br. Filament String |
| 44 | 3 Meg. | ¼ | | BTS-3.3 Meg. | Or.-Blk.-Grn. AVC Network |
| 45 | 3.9 Meg. | ¼ | | BTS-3.9 Meg. | Or.-White-Grn. AVC Network |
| 46 | 220KΩ | ¼ | | BTS-220K | Red-Red-Yl. Oscillator Grid |
| 47 | 68KΩ | ¼ | | BTS-68K | Blue-Gray-Or. Converter Screen Dropping |
| 48 | 1000Ω | ¼ | | BTS-1000 | Br.-Blk.-Red Converter Plate Decoupling |
| 49 | 3.3 Meg. | ¼ | | BTS-3.3 Meg. | Or.-Or.-Grn. AVC Network |
| 50 | 22KΩ | ¼ | | BTS-22K | Red-Red-Or. Oscillator Anode Load |
| 51 | 3.3 Meg. | ¼ | | BTS-3.3 Meg. | Or.-Or.-Grn. 1st IF Grid |
| 52 | 22KΩ | ¼ | | BTS-22K | Red-Red-Or. 1st IF Plate Load |
| 53 | 470KΩ | ¼ | | BTS-470K | Yl.-Vi.-Yl. 2nd IF Grid |
| 54 | 1000Ω | ¼ | | BTS-1000 | Br.-Blk.-Red 2nd IF Plate Decoupling |
| 55 | 47KΩ | ¼ | | BTS-47K | Yl.-Vi.-Or. Diode RF Filter |
| 56 | 470KΩ | ¼ | | BTS-470K | Yl.-Vi.-Yl. Diode Load |
| 57 | 330Ω | ¼ | | BW-½-330 | Or.-Or.-Br. Filament Shunt |
| 58 | 12 Meg. | ¼ | | BTS-12 Meg. | Br.-Red-Grn. AF Grid |
| 59 | 470KΩ | ¼ | | BTS-470K | Yl.-Vi.-Yl. AF Plate Load |
| 60 | 100KΩ | ¼ | | BTS-100K | Br.-Blk.-Red AF Plate Decoupling |
| 61 | 470KΩ | ¼ | | BTS-470K | Yl.-Vi.-Yl. Output Grid |
| 62 | 100Ω | 1 | | BW-1-100 | Br.-Blk.-Br. Output Cathode |
| 63 | 220Ω | 30 | | EPA-250 | Line Dropping-See Note 1 |
| 64 | 500Ω | 1 | | BTA-470 | Grn.-Blk.-Br. Filter |
| 65 | 330Ω | ¼ | | BW-½-330 | Or.-Or.-Br. Filament Shunt |
| 66 | 27Ω | ¼ | | BW-½-27 | Red-Vi.-Blk. Series Filament |
| 67 | 820Ω | ¼ | | BTS-820 | Gray-Red-Br. Filament String |
| 68 | 260Ω | 50 | | EPA-300 | Line Dropping-See Note 2 |
| 69 | 260Ω | 50 | | EPA-300 | " " " " " |
| 70 | 40Ω | 10 | | ABA-50 | Rectifier Ballast-See Note 3 |

Note 1 - On IRC replacement set slider @ 220Ω from one end.
Note 2 - Used in 220 volt operation only. On IRC replacement set slider @ 260Ω from one end.
Note 3 - Not used in all models. On IRC replacement set slider @ 40Ω from one end.

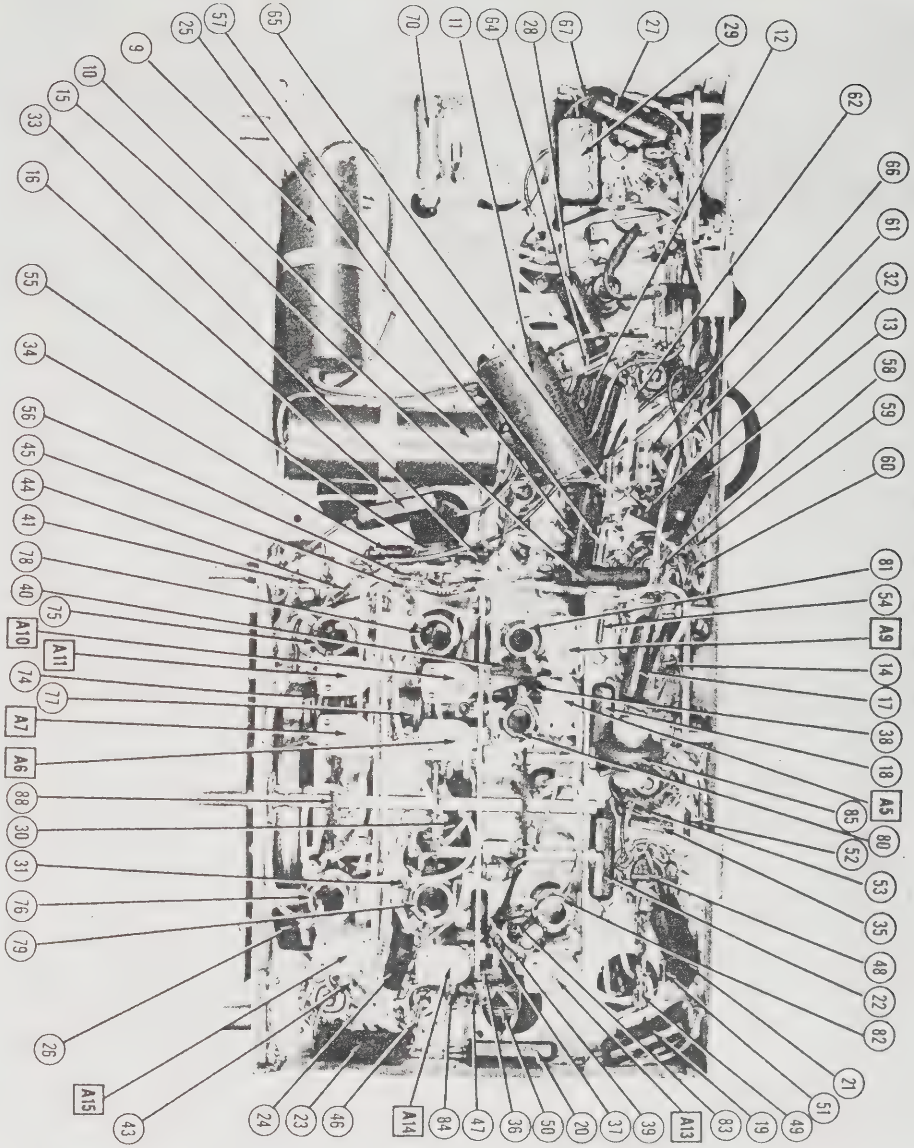
## TRANSFORMER (OUTPUT)

| ITEM No. | RATING | | | | REPLACEMENT DATA | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|---|
| | IMPEDANCE | | DC RES. | | ESPEY PART No. | STANCOR PART No. | THORDAR'N PART No. | | |
| | PRI. | SEC. | PRI. | SEC. | | | | | |
| 71 | 1100Ω<br>tappe<br>@30Ω | 3Ω | 300Ω<br>CT | .4Ω | | | | | |

## SPEAKER

| ITEM No. | RATINGS | | REPLACEMENT DATA | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|
| | | | ESPEY PART No. | JENSEN PART No. | | |
| 72 | FIELD<br>PM | VC IMP.<br>3Ω | | ST-112<br>Mod. P6-T | | |
| 73 | CONE DIA.<br>6" | VC DIA.<br>3/4" | NOT READILY REPLACEABLE-USE COMPLETE SPEAKER UNIT | | | |

## CHASSIS—BOTTOM VIEW



PHOTOFACT* Fol

*TRADE MARK

## ESPEY
## MODEL 581

**TRADE NAME** Espey, Model
**MANUFACTURER** Espey Mfg. C
**TYPE SET** Three Power
**TUBES (EIGHT)** Types, 1LN5
Det.-AVC-AF,
35Y4 Rectifi
**POWER SUPPLY** 105-125 Volt
**RATING** .270 Amp. @ 1
**TUNING RANGE—BROADCAST** 54

**ALIGNMENT**

To set pointer turn variat
of dial. Use battery power
available. If not, connect
Volume control should be a
sary to obtain output read

| DUMMY ANTENNA | SIGNAL GENERATOR COUPLING |
|---|---|
| .1 MFD. | High side to center stator of variable. Low side to B-. |
| 200MMFD | High side to ant. terminal. Low side to chassis. |
| 200MMFD | " |
| 200MMFD | " |
| 400Ω | " |
| 400Ω | " |
| 400Ω | " |
| 400Ω | " |
| 400Ω | " |
| 400Ω | " |

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"The listing of any available replacement par
case a recommendation, warranty or guaranty
as to the quality and suitability of such replac
parts have been compiled from information fur
Inc., by the manufacturers of the particular t
"Reproduction or use, without express permi

NOTE:(1) READINGS TAKEN IN AC-DC POSITION ON ALL TUBES EXCEPT 3Q5GT WHICH WAS TAKEN IN BATTERY POSITION.
(2) READINGS TAKEN IN STANDARD BROADCAST POSITION.

VOLTAGE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 1LN5 | 3 V.DC | 110 V.DC | 110 V.DC | 1.4 V.DC | 1.4 V.DC | 0V. | 0V. | 1.4 V.DC |
| 2 | 1LC6 | 4.5 V.DC | 110 V.DC | 70 V.DC | -3 V.DC | 45 V.DC | .3 V.DC | 0V. | 3 V.DC |
| 3 | 1LN5 | 6 V.DC | 80 V.DC | 110 V.DC | 4.5 V.DC | 4.5 V.DC | .4 V.DC | 110 V.DC | 4.5 V.DC |
| 4 | 1LN5 | 7.2 V.DC | 110 V.DC | 110 V.DC | 6 V.DC | 6 V.DC | 1.6 V.DC | 4.5 V.DC | 6 V.DC |
| 5 | 1LH4 | 0V. | 65 V.DC | 105 V.DC | .6 V.DC | 110 V.DC | -2 V.DC | .6 V.DC | 1.4 V.DC |
| 6 | 50A5 | 0V. | 105 V.DC | 110 V.DC | 0V. | 0V. | 1.2 V.DC | 9.4 V.DC | 52 V.AC |
| 7 | 35Y4 | 83 V.AC | 113 V.AC | 0V. | 78 V.AC | 0V. | 0V. | 115 V.DC | 52 V.AC |
| 8 | 3Q5GT | 3.1 V.DC | 11 V.DC | 90 V.DC | 92 V.DC | 1 V.DC | 12.5 V.DC | 8 V.DC | 9.5 V.DC |

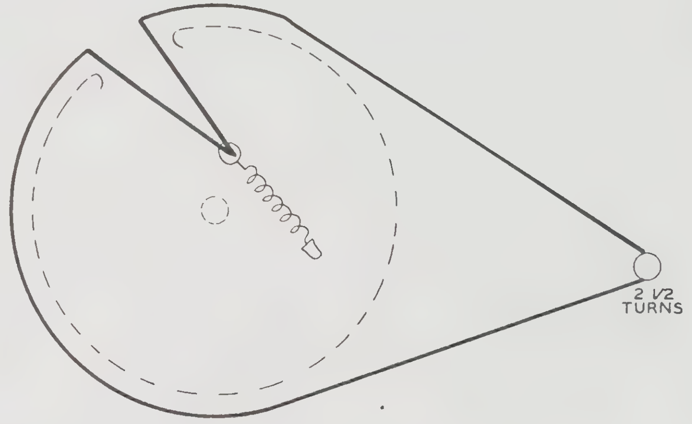
RESISTANCE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 1LN5 | * | 115 KΩ | 115 KΩ | * | * | 3.1 MEG. | INF. | * |
| 2 | 1LC5 | * | 115 KΩ | 140 KΩ | 210 KΩ | 195 KΩ | 2.5 MEG. | INF. | * |
| 3 | 1LN5 | * | 135 KΩ | 115 KΩ | * | * | 2.4 MEG. | 115 KΩ | * |
| 4 | 1LN5 | * | 115 KΩ | 115 KΩ | * | * | 460 KΩ | 25 Ω | * |
| 5 | 1LH4 | 0 Ω | 700 KΩ | 215 KΩ | 500 KΩ | 115 KΩ | 12 MEG. | 500 KΩ | * |
| 6 | 50A5 | 0 Ω | 115 KΩ | 115 KΩ | INF. | INF. | 410 KΩ | 130 Ω | 46 Ω |
| 7 | 35Y4 | 77 Ω | 310 Ω | INF. | 72 Ω | INF. | 0 Ω | 115 KΩ | 46 Ω |
| 8 | 3Q5GT | * | * | 225 KΩ | 225 KΩ | 410 KΩ | * | * | * |

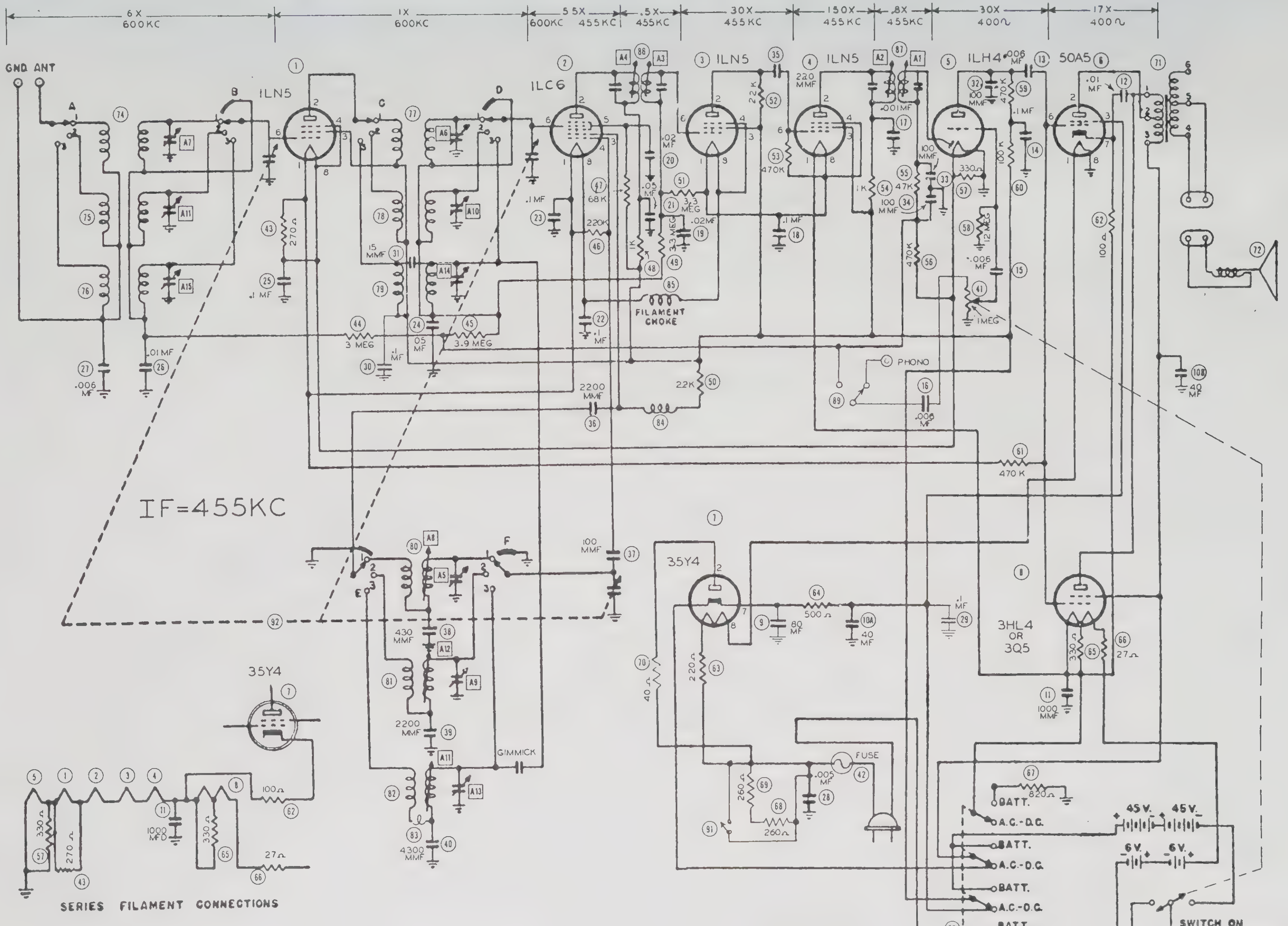
* DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE.

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

1 - DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Line voltage maintained at 117 volts for voltage readings.
5 - Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6 - Volume control at maximum, no signal applied for voltage measurements.

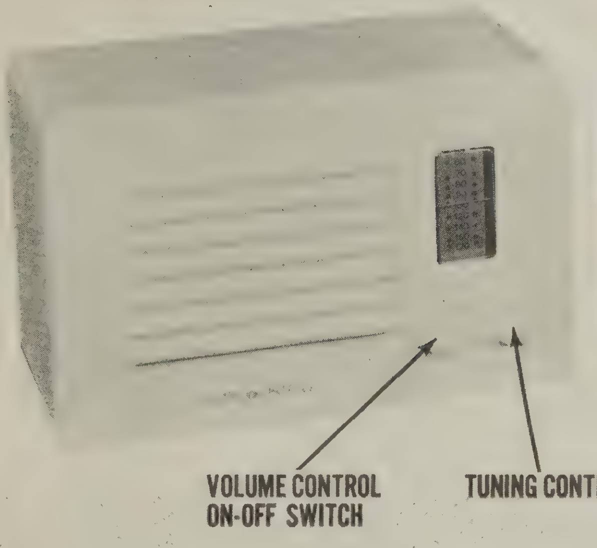


DIAL CORD DRIVE

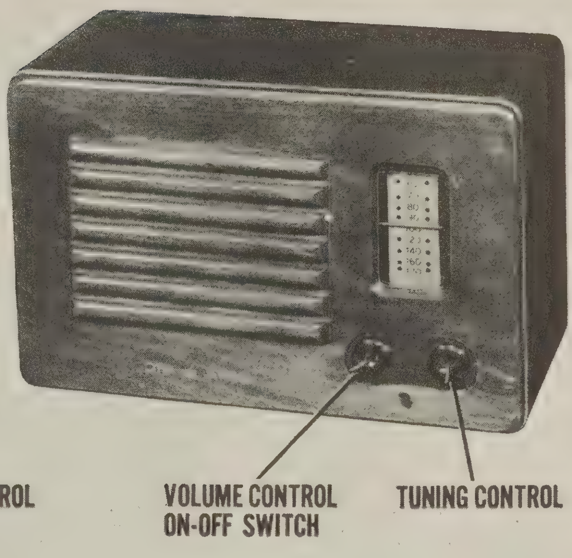


THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE 474-10

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative by shorting diode load resistor.



MODEL 4610



MODEL 4609

AIR KING MODELS 4609, 4610

| | | | |
|---|---|---|---|
| **TRADE NAME** | Air King, Models 4609, 4610 | | |
| **MANUFACTURER** | Air King Products Co., Inc., 1523 63rd St., Brooklyn, N.Y. | | |
| **TYPE SET** | AC-DC Operated Superheterodyne Receiver | | |
| **TUBES** (FIVE) | Types, 12SA7GT Converter, 12SK7GT IF Amp., 12SQ7GT Det.-AVC-AF, 50L6GT Power Output, 35Z5GT Rectifier. | | |
| **POWER SUPPLY** | 105-125 Volts AC-DC | | |
| **TUNING RANGE—BROADCAST** | 540-1720KC | RATING | .225 Amp. @ 117 Volts AC |

**ALIGNMENT INSTRUCTIONS**

Use isolation transformer if available. If not, connect capacitor in series with the low side of the signal generator and chassis. Set volume control at maximum volume and keep input from signal generator no higher than is necessary to obtain output reading. Use insulated alignment screwdriver for adjusting.

| DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | RADIO DIAL SETTING | OUTPUT METER | ADJUST | REMARKS |
|---|---|---|---|---|---|---|
| .05 MFD. | High side to stator of rear section of variable. Low side to chassis. | 455KC | High freq. end. | Across voice coil | A1,A2, A3,A4. | Adjust for maximum output. If isolation trans. is not used, reduce dummy ant. to .001 MFD. to reduce hum modulation. |
| 200 MFD. | High side to ext. ant. Low side to chassis. | 1600KC | 1600KC | " | A5 | Adjust for maximum output. |
| 200 MFD. | " | 1400KC | Tune for maximum output. | " | A6 | " " " " |

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# PARTS LIST AND DESCRIPTIONS

## TUBES

| ITEM No. | USE | REPLACEMENT DATA |  | RMA BASE TYPE | INSTALLATION NOTES |
|---|---|---|---|---|---|
|  |  | AIR KING PART No. | STANDARD REPLACEMENT |  |  |
| 1 | Converter | 12SA7GT | 12SA7GT | 8AD |  |
| 2 | IF Amp. | 12SK7GT | 12SK7GT | 8N |  |
| 3 | Det.-AVC-AF | 12SQ7GT | 12SQ7GT | 8Q |  |
| 4 | Power Output | 50L6GT | 50L6GT | 7AC |  |
| 5 | Rectifier | 35Z5GT | 35Z5GT | 6AD |  |

## CAPACITORS

**Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING |  | REPLACEMENT DATA |  |  |  |  |  | IDENTIFICATION CODES AND INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|---|
|  | CAP. | VOLT | AIR KING PART No. | SOLAR PART No. | SPRAGUE PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. |  |
| 6A | 40 | 150 | 2068 | M-2x40-150 | TA-440 | PRSA150-40-40 | BRD4415 | 2N511 | Filter - Red |
| B | 40 | 150 |  |  |  |  |  |  | " - Blue |
| 7 | .05 | 400 |  | S-4-05 | TC-15 | 484-05 | DT4S5 | TP426 | Line Filter |
| 8 | .01 | 400 |  | S-4-01 | TC-11 | 484-01 | DT4S1 | TP421 | Output Plate Bypass |
| 9 | .02 | 400 |  | S-4-02 | TC-12 | 484-02 | DT4S2 | TP423 | Audio Coupling |
| 10 | .002 | 600 |  | S-6-002 | TC-22 | 684-002 | DT6D2 | TP405 | " " |
| 11 | .05 | 400 |  | S-4-05 | TC-15 | 484-05 | DT4S5 | TP426 | RF Bypass Pwr. Supp. |
| 12 | .05 | 400 |  | S-4-05 | TC-15 | 484-05 | DT4S5 | TP426 | AVC Filter |
| 13 | .001 | 600 |  | S-6-001 | TC-21 | 684-001 | DT6D1 | TP404 | Audio Plate Bypass |
| 14 | .005 | 400 |  | S-6-004 | TC-25 | 484-005 | DT6D5 | TP408 | Ant. Coupling |
| 15 | 220 | 500 |  | M0.5-32 | 1FM-32 | 1468-0002 | 5W5T2 | MC237 | IF Bypass Vol. Cont. |
| 16 | .47 | 500 |  | M0.5-45 | 1FM-45 | 1468-00005 | 5W5Q5 | MC225 | Osc. Grid Capacitor |

## CONTROLS

| ITEM No. | RATING |  | REPLACEMENT DATA |  |  |  | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|
|  | RESIST-ANCE | WATTS | AIR KING PART No. | MALLORY PART No. | IRC PART No. | CLAROSTAT PART No. |  |
| 17A | 500KΩ | 1 |  | MR48 | D13-133 | M-60-Z | Volume Control |
| B | Shaft |  |  | Not Req. | A | Not Req. | Attach to 17A per instructions |
| C | Switch |  |  | M26 | 41 | SW-A | " " " " " |

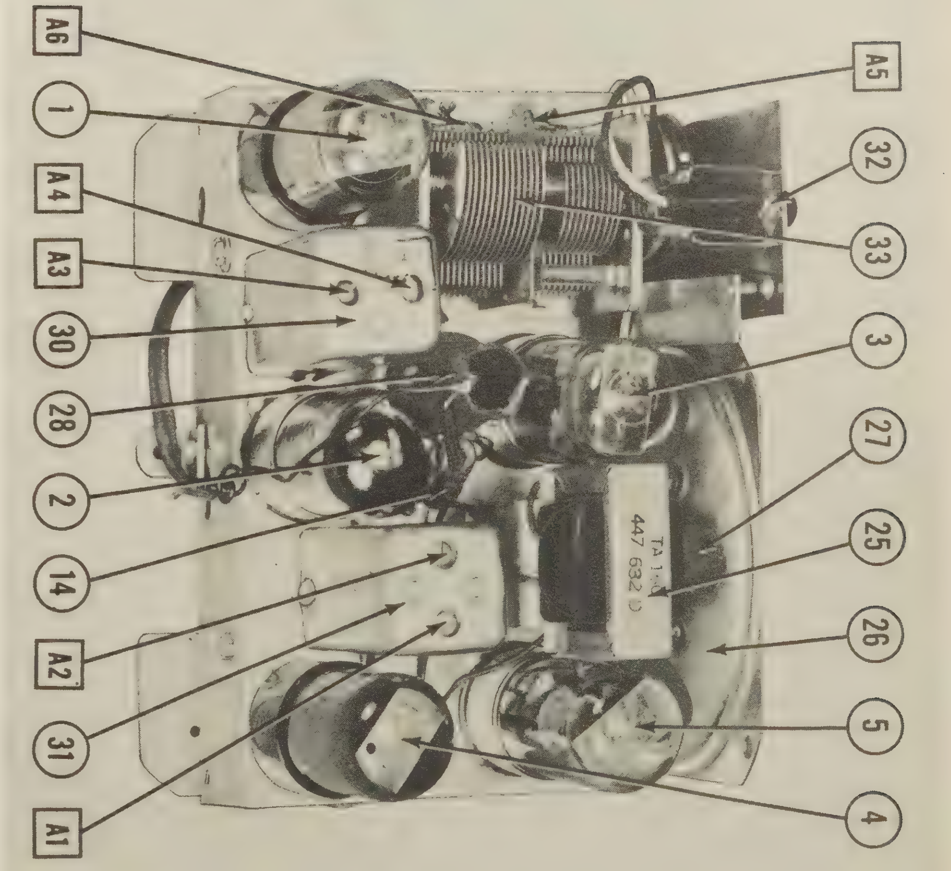
## RESISTORS

| ITEM No. | RATING |  | REPLACEMENT DATA |  | IDENTIFICATION CODES |
|---|---|---|---|---|---|
|  | RESISTANCE | WATTS | AIR KING PART No. | IRC PART No. |  |
| 18 | 15KΩ | ½ |  | BTS-15K | Br.-Grn.-Or. Oscillator Grid |
| 19 | 2.2 Meg. | ½ |  | BTS-2.2 Meg. | Red-Red-Grn. AVC Network |
| 20 | 4.7 Meg. | ½ |  | BTS-4.7 Meg. | Yl.-Vl.-Grn. 1st AF Grid |
| 21 | 220KΩ | ½ |  | BTS-220K | Red-Red-Yl. 1st AF Plate Load |
| 22 | 150KΩ | ½ |  | BTS-150K | Br.-Grn.-Yl. Output Grid |
| 23 | 18Ω | ½ |  | BW-½-18 | Br.-Gray-Blk. Rectifier Ballast |
| 24 | 2200Ω | 1 |  | BTA-2200 | Red-Red-Red Filter |

## TRANSFORMER (OUTPUT)

| ITEM No. | RATING |  |  |  | REPLACEMENT DATA |  |  |  | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|---|
|  | IMPEDANCE |  | DC RES. |  | AIR KING PART No. | STANCOR PART No. | THORDAR'N PART No. |  |  |
|  | PRI. | SEC. | PRI. | SEC. |  |  |  |  |  |
| 25 | 2000Ω | 2.9Ω | 144Ω | .54Ω | Part of 5867 | A-3876‡ | T14S82‡ |  | ‡Bend mounting tabs down, file slots and mount on original bracket. |

# CHASSIS—TOP VIEW



# PARTS LIST AND DESCRIPTIONS (Continued)

## SPEAKER

| ITEM No. | RATINGS | | REPLACEMENT DATA | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|
| | | | AIR KING PART No. | JENSEN PART No. | | |
| 26 | FIELD<br>PM | VC IMP.<br>2.9Ω | 5867 | ST-113<br>Mod. P4-X | | |
| 27 | CONE DIA.<br>3-15/16" | VC DIA.<br>1/2" | NOT READILY REPLACEABLE - USE COMPLETE SPEAKER UNIT. | | | |

## R F COILS

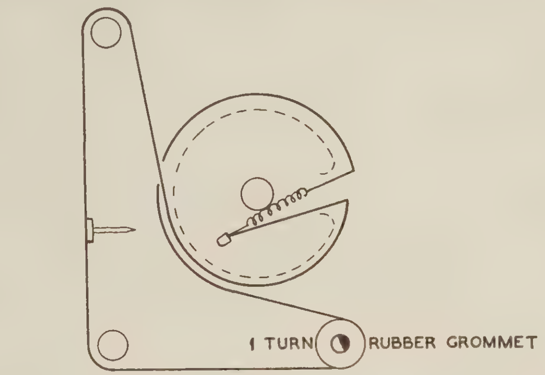
| ITEM No. | USE | DC RES. | | REPLACEMENT DATA | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|
| | | PRI. | SEC. | AIR KING PART No. | MEISSNER PART No. | |
| 28 | Ant. Coil | 60Ω | 5Ω | | | |
| 29 | Osc. Coil | 4.5Ω | | 28149-5 | 14-1040 | |
| 30 | Input IF | 11.5Ω | 13Ω | 3364-A | 16-6666 | |
| 31 | Output IF | 11.5Ω | 11.5Ω | 3365-A | 16-6667 | |

## DIAL LIGHT

| ITEM No. | BASE TYPE | VOLTS | AMPS. | BEAD COLOR | REPLACEMENT DATA | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|
| | | | | | AIR KING PART No. | | |
| 32 | Bayonet | 6-8 | 0.15 | brown | | | Type 47 |

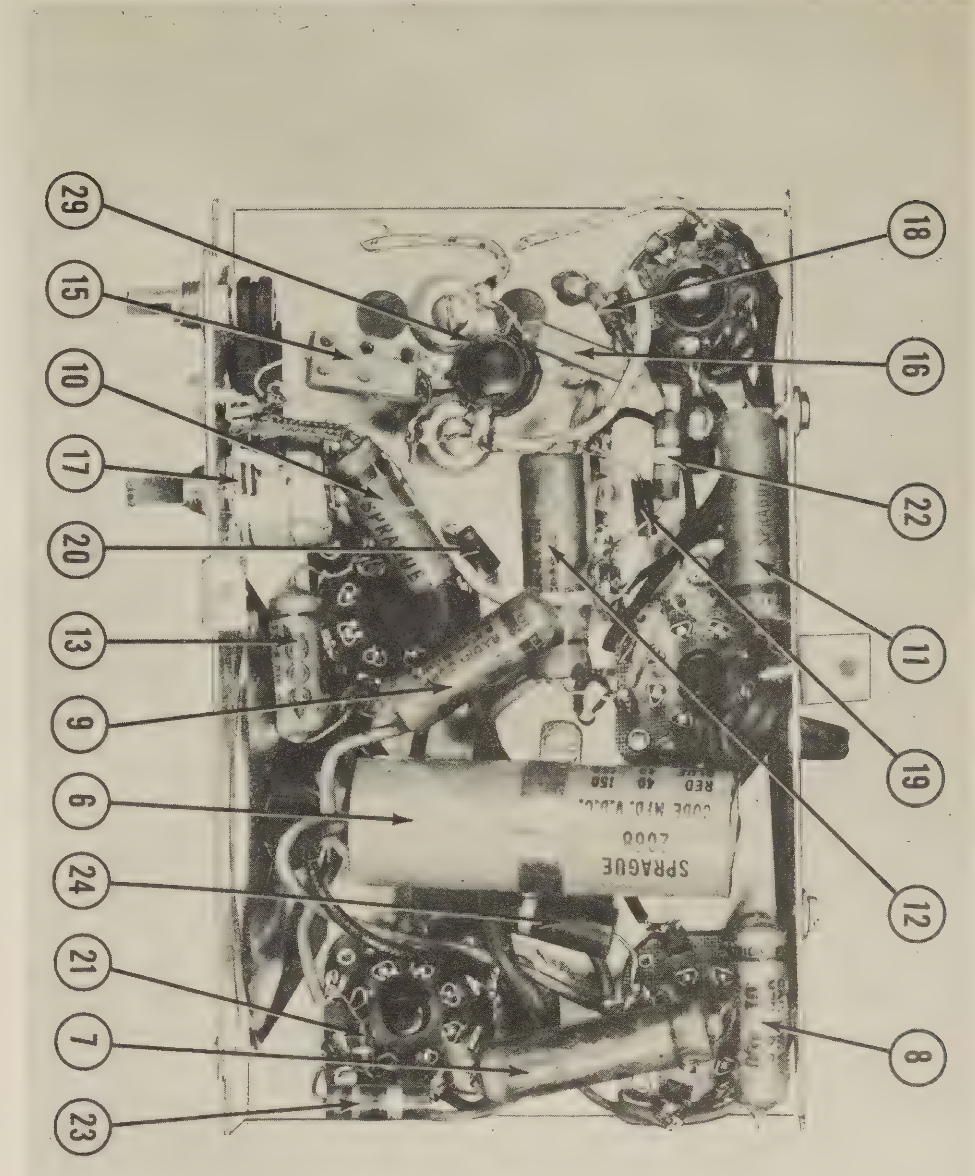
## MISCELLANEOUS

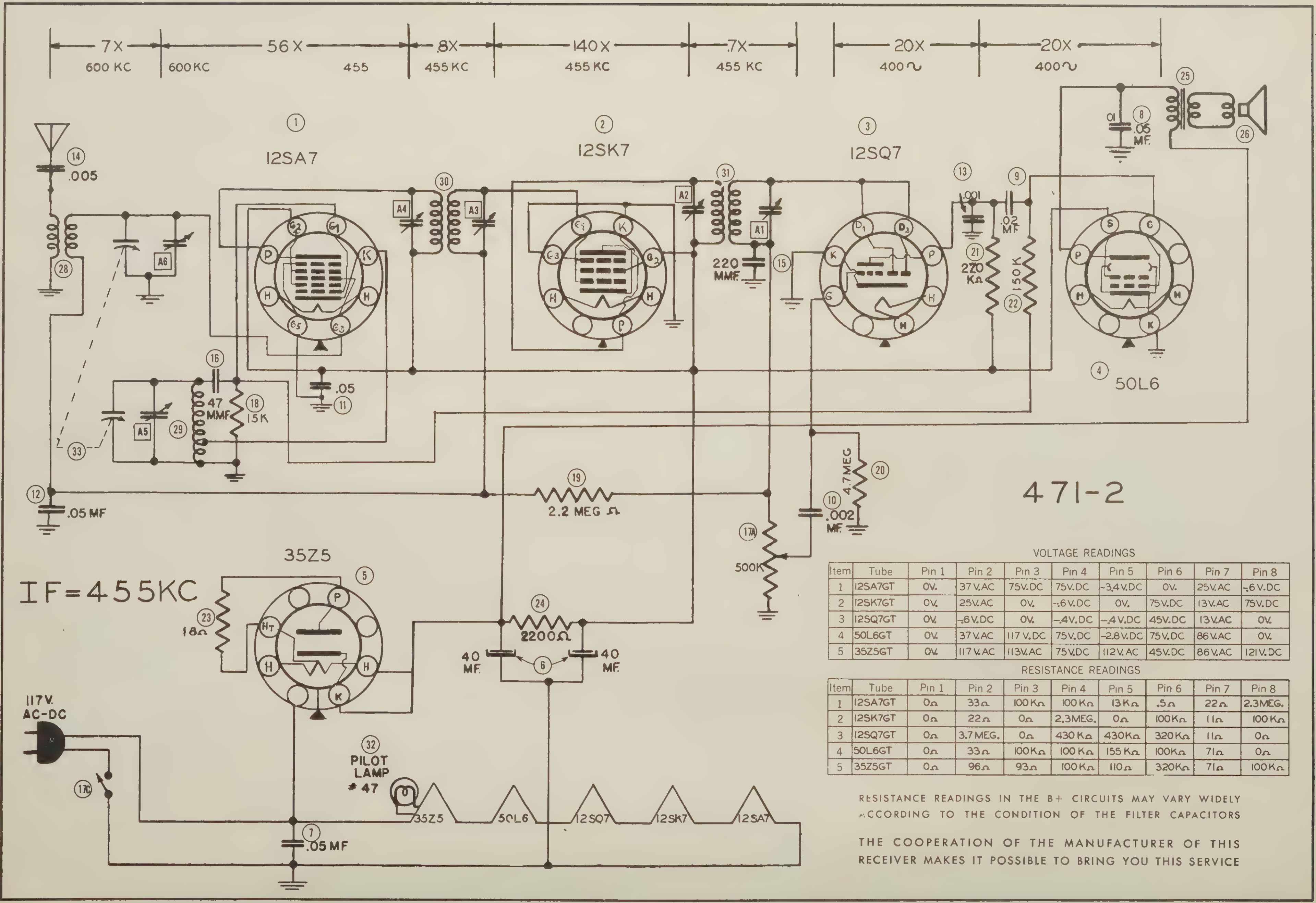
| ITEM No. | PART NAME | AIR KING PART No. | NOTES |
|---|---|---|---|
| 33 | 2 Gang Var. Cap. | 1662-D | Ant. & Osc. Trimmers Included |



DIAL CORD DRIVE

## CHASSIS—BOTTOM VIEW





VOLTAGE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 12SA7GT | 0V. | 37 V.AC | 75V.DC | 75V.DC | -3.4 V.DC | 0V. | 25V.AC | -.6 V.DC |
| 2 | 12SK7GT | 0V. | 25V.AC | 0V. | -.6 V.DC | 0V. | 75 V.DC | 13V.AC | 75V.DC |
| 3 | 12SQ7GT | 0V. | -.6 V.DC | 0V. | -.4V.DC | -.4 V.DC | 45V.DC | 13V.AC | 0V. |
| 4 | 50L6GT | 0V. | 37 V.AC | 117 V.DC | 75V.DC | -2.8 V.DC | 75 V.DC | 86 V.AC | 0V. |
| 5 | 35Z5GT | 0V. | 117 V.AC | 113V.AC | 75V.DC | 112V. AC | 45V.DC | 86 V.AC | 121V.DC |

RESISTANCE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 12SA7GT | 0Ω | 33Ω | 100 KΩ | 100 KΩ | 13 KΩ | .5Ω | 22Ω | 2.3MEG. |
| 2 | 12SK7GT | 0Ω | 22Ω | 0Ω | 2.3MEG. | 0Ω | 100KΩ | 11Ω | 100 KΩ |
| 3 | 12SQ7GT | 0Ω | 3.7 MEG. | 0Ω | 430 KΩ | 430KΩ | 320 KΩ | 11Ω | 0Ω |
| 4 | 50L6GT | 0Ω | 33Ω | 100KΩ | 100 KΩ | 155 KΩ | 100KΩ | 71Ω | 0Ω |
| 5 | 35Z5GT | 0Ω | 96Ω | 93Ω | 100 KΩ | 110Ω | 320KΩ | 71Ω | 100 KΩ |

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

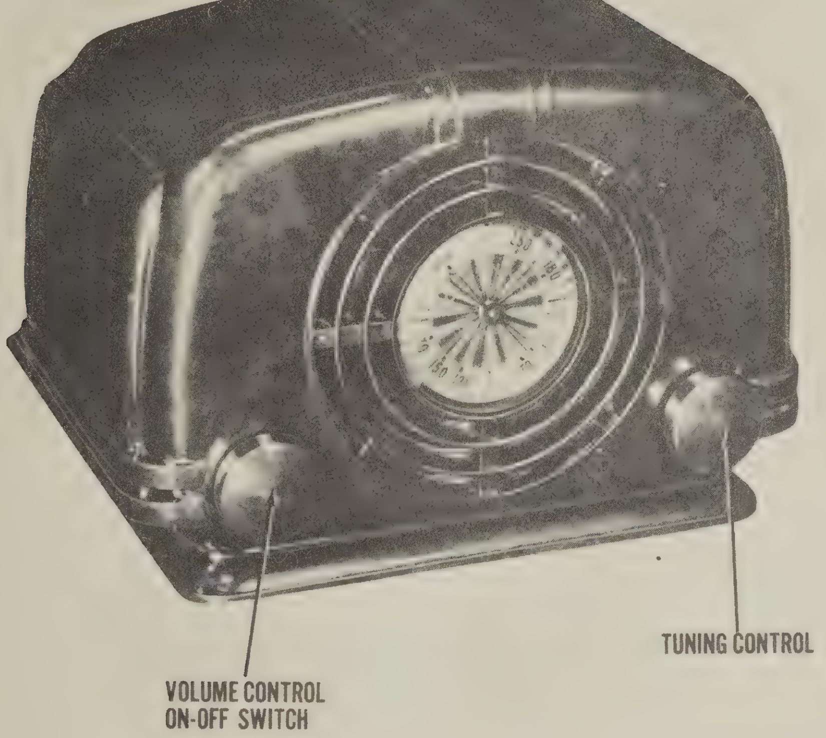
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

**PHOTOFACT* Folder**

*TRADE MARK



CORONADO MODEL 43-8160

| | |
|---|---|
| **TRADE NAME** | Coronado, Model 43-8160 |
| **MANUFACTURER** | "Coronado"- Minneapolis, Minn. - Los Angeles, Calif. |
| **TYPE SET** | AC-DC Operated Superheterodyne Receiver-Self Contained Loop Antenna |
| **TUBES** | (FIVE)Types 12SA7 Converter, 12SK7 IF Amp, 12SQ7 Det.-AVC-AF, 50L6GT Power Output 35Z5GT Rectifier |
| **POWER SUPPLY** | 105-125 Volts AC-DC |
| **TUNING RANGE—BROADCAST** | 537-1720KC |
| RATING | .250 Amp. @ 117 Volts AC |

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning control fully counter clockwise and adjust pointer to last reference mark on low frequency end of dial. When aligning, ant. plate should be attached to back of chassis as when in cabinet. Use isolation transformer if available. If not, connect capacitor in series with low side of signal generator and B-. Volume control should be at maximum volume and output of signal generator no higher than necessary to obtain output reading. Use insulated alignment screwdriver for adjusting.

| DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | RADIO DIAL SETTING | OUTPUT METER | ADJUST | REMARKS |
|---|---|---|---|---|---|---|
| .1 MFD. | High side to ext. ant. clip. Low side to B-. | 455KC | Iron Cores completely out. | Across voice coil | A1,A2, A3,A4. | Adjust for maximum output. If isolation transformer is not used reduce dummy to .001 MFD. to reduce hum modulation. |
| .1 MFD. | " | 1720KC | " | " | A5 | Adjust for maximum output. |
| 200 MMFD | " | " | " | " | A6 | " |
| 200 MMFD | " | 1400KC | Tune for maximum output. | " | Ant.Coil (#32) | Adjust position of coil for maximum output. |
| 200 MMFD | " | 1720KC | 1720KC | " | A6 | Check to see if any change is needed in adjustment of A6. If so recheck ant. coil. |

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# PARTS LIST AND DESCRIPTIONS

## TUBES

| ITEM No. | USE | REPLACEMENT DATA<br>CORONADO PART No. | STANDARD REPLACEMENT | RMA BASE TYPE | INSTALLATION NOTES |
|---|---|---|---|---|---|
| 1 | Converter | 12SA7 | 12SA7 | 8R | |
| 2 | IF Amp. | 12SK7GT | 12SK7GT | 8N | |
| 3 | Det.-AVC-AF | 12SQ7GT | 12SQ7GT | 8Q | |
| 4 | Power Output | 50L6GT | 50L6GT | 7AC | |
| 5 | Rectifier | 35Z5GT | 35Z5GT | 6AD | |

## CAPACITORS

**Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | | IDENTIFICATION CODES AND INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|---|
| | CAP. | VOLT | CORONADO PART No. | SOLAR PART No. | SPRAGUE PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | |
| 6A | 40 | 150 | | DY-4020-150 | EL-24 | AF84D4A + | UP4CJ59+ | FP306+ | ■ Filter |
| B | 20 | 150 | | | | | | | ▲ " |
| 7 | .05 | 400 | | S-4-05 | TC-15 | 484-05 | DT4S5 | TP426 | Line Filter |
| 8 | .02 | 400 | | S-4-02 | TC-12 | 484-02 | DT4S2 | TP423 | Output Plate Bypass |
| 9 | .004 | 600 | | S-6-004 | TC-24 | 684-004 | DT6D4 | TP407 | Audio Coupling |
| 10 | .002 | 600 | | S-6-002 | TC-22 | 684-002 | DT6D2 | TP405 | " " |
| 11 | .05 | 200 | | S-4-05 | TC-15 | 484-05 | DT4S5 | TP426 | AVC Filter |
| 12 | .15 | 400 | | S-4-2 | TC-2 | 484-.2 | DT4P2 | TP429 | Line Isolation |
| 13 | 500 | 500 | | M0.5-35 | 1FM-35 | 1468-0005 | 5W5T5 | MC245 | Audio Plate Bypass |
| 14 | 250 | 500 | | M0.5-325 | 1FM-325 | 1468-00025 | 5W5T25 | MC240 | IF Bypass Vol. Cont. |
| 15 | 50 | 500 | | M0.5-45 | 1FM-45 | 1468-00005 | 5W5Q5 | MC225 | Osc. Grid Capacitor |
| 16 | 300 | 500 | | M0.5-33 | 1FM-33 | 1468-0003 | 5W5T3 | MC241 | Ant. Coupling |

+Do not use bypass section.

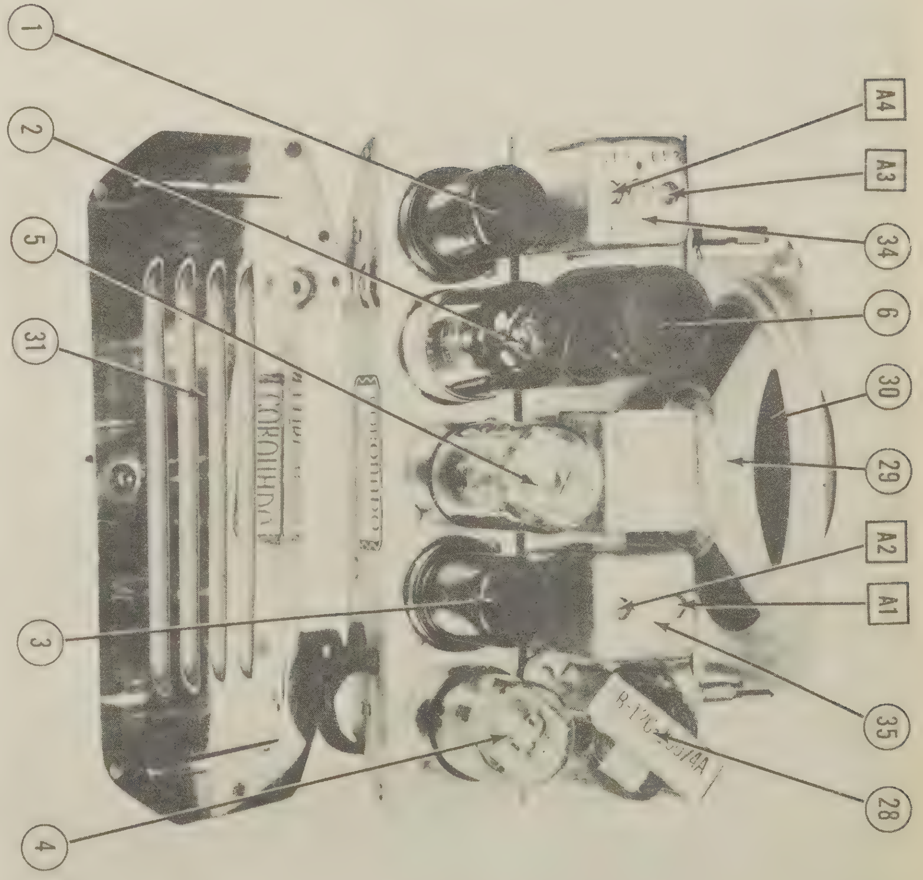
## CONTROLS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|
| | RESISTANCE | WATTS | CORONADO PART No. | MALLORY PART No. | IRC PART No. | CLAROSTAT PART No. | |
| 17A | 500KΩ | 1 | 101272 | MK401 | D13-133 | AM-60-Z | Volume Control. |
| B | Shaft | | Not Req. | Not Req. | E | KS-3 | Attach to 17A per instructions. |
| C | Switch | | " " | M26 | 41 | SW-A | " " " " " |

## RESISTORS

| ITEM No. | RATING | | REPLACEMENT DATA | | IDENTIFICATION CODES |
|---|---|---|---|---|---|
| | RESISTANCE | WATTS | CORONADO PART No. | IRC PART No. | |
| 18 | 22KΩ | ½ | | BTS-22K | Red-Red-Or. Oscillator Grid |
| 19 | 150KΩ | ½ | | BTS-150K | Br.-Grn.-Yl. Line Isolation |
| 20 | 3.3 Meg. | ½ | | BTS-3.3 Meg. | Or.-Or.-Grn. AVC Network |
| 21 | 4.7 Meg. | ½ | | BTS-4.7 Meg. | Yl.-Vi.-Grn. AF Grid |
| 22 | 150KΩ | ½ | | BTS-150K | Br.-Grn.-Yl. AF Plate Load |
| 23 | 220KΩ | ½ | | BTS-220K | Red-Red-Yl. Output Grid |
| 24 | 150Ω | ½ | | BW-½-150 | Br.-Grn.-Br. " Cathode |
| 25 | 1200Ω | 1 | | BTA-1200 | Br.-Red-Red- Filter |
| 26 | 27Ω | ½ | | BW-½-27 | Red-Vi.-Blk. Rectifier Ballast |
| 27 | 33Ω | 1 | | BW-1-33 | Or.-Or.-Blk. Series Filament |

## CHASSIS—TOP VIEW



# PARTS LIST AND DESCRIPTIONS (Continued)

## TRANSFORMER (OUTPUT)

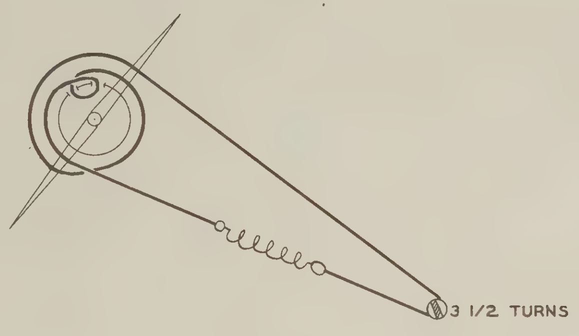
| ITEM No. | RATING |  |  |  | REPLACEMENT DATA |  |  |  | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|---|
|  | IMPEDANCE |  | DC RES. |  | CORONADO PART No. | STANCOR PART No. | THORDAR'N PART No. |  |  |
|  | PRI. | SEC. | PRI. | SEC. |  |  |  |  |  |
| 28 | 2300Ω | 3.7Ω | 190Ω | .7Ω | B-12C-10074 | A-3876 | T22S45 |  |  |

## SPEAKER

| ITEM No. | RATINGS |  | REPLACEMENT DATA |  |  | INSTALLATION NOTES |
|---|---|---|---|---|---|---|
|  |  |  | CORONADO PART No. | JENSEN PART No. |  |  |
| 29 | FIELD<br>PM | VC IMP.<br>3.7Ω | 114268 | ST-113<br>Mod. P4-X |  | Some models may use dynamic speaker. |
| 30 | CONE DIA.<br>4" | VC DIA.<br>½" | NOT READILY REPLACEABLE-USE COMPLETE SPEAKER UNIT. |  |  |  |

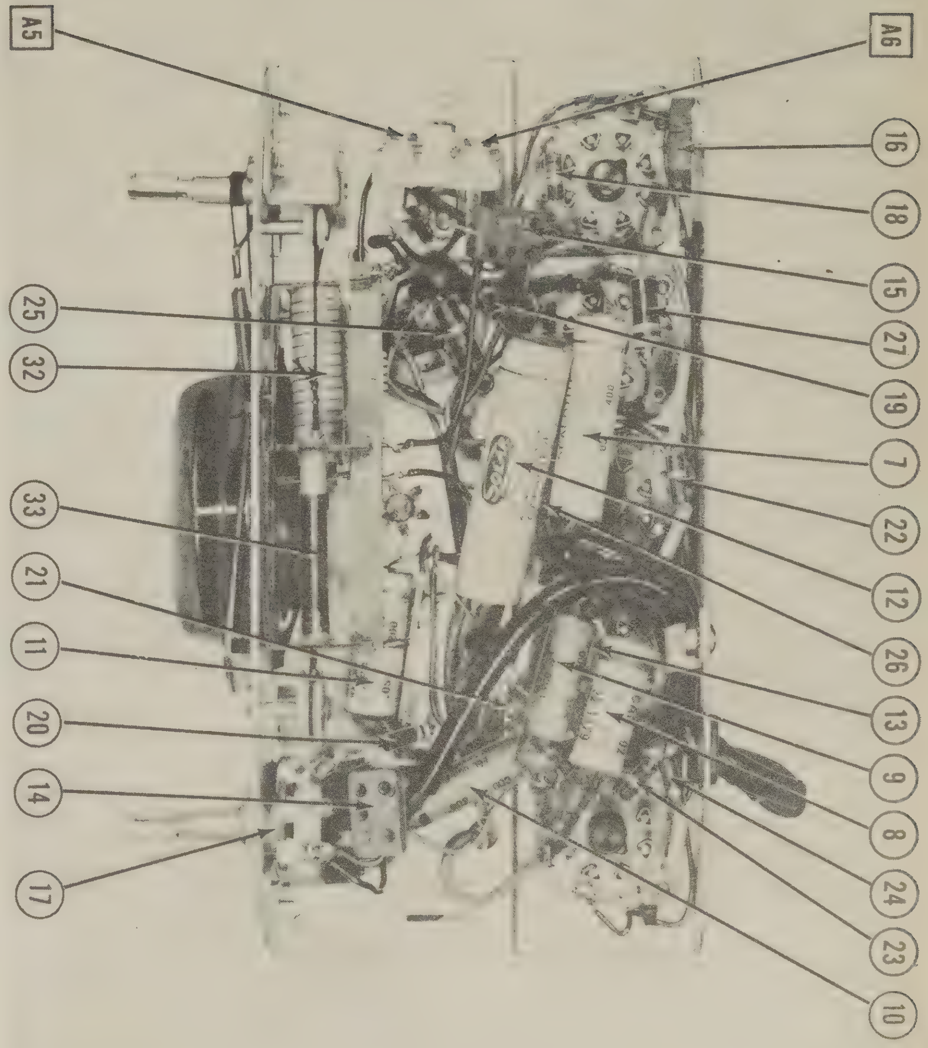
## R F COILS

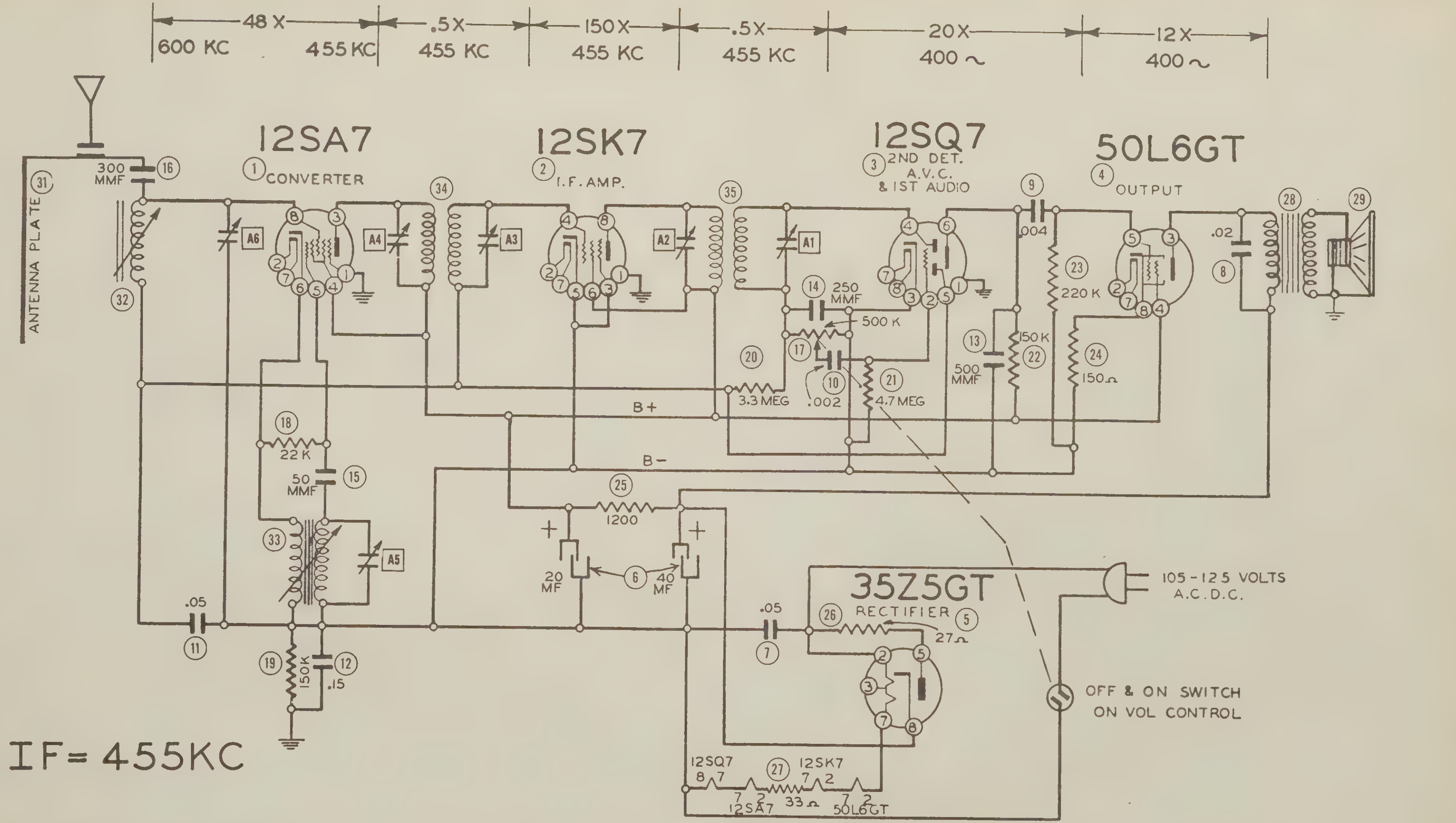
| ITEM No. | USE | DC RES. |  | REPLACEMENT DATA |  | INSTALLATION NOTES |
|---|---|---|---|---|---|---|
|  |  | PRI. | SEC. | CORONADO PART No. | MEISSNER PART No. |  |
| 31 | Plate Ant. |  |  |  |  |  |
| 32 | Ant. Coil |  | 9.3Ω |  |  | Items 32 & 33 ganged together and slug tuned. |
| 33 | Osc. Coil | .6Ω | 6.8Ω |  |  |  |
| 34 | Input IF | 40.5Ω | 40Ω | 108157H | 16-6666 |  |
| 35 | Output IF | 32Ω | 36Ω | 1081570R | 16-6667 |  |



DIAL CORD DRIVE

# CHASSIS—BOTTOM VIEW





IF = 455KC

VOLTAGE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 12SA7 | 0V. | 23 V.AC | 93 V.DC | 93 V.DC | –5.9 V.DC | 0V. | 11.5 V.AC | –.4 V.DC |
| 2 | 12SK7GT | 0V. | 38 V.AC | 0V. | –.4 V.DC | 0V. | 93 V.DC | 27 V.AC | 93 V.DC |
| 3 | 12SQ7GT | 0V. | –.6 V.DC | 0V. | –.3 V.DC | –.4 V.DC | 65 V.DC | 11.5 V.AC | 0V. |
| 4 | 50L6GT | 0V. | 87 V.AC | 124 V.DC | 93 V.DC | 0V. | 0V. | 38 V.AC | 6 V.DC |
| 5 | 35Z5GT | 0V. | 117 V.AC | 112 V.AC | 130 V.DC | 115 V.AC | 0V. | 87 V.AC | 130 V.DC |

RESISTANCE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 12SA7 | 160 KΩ | 22 Ω | 25 KΩ | 25 KΩ | 20 KΩ | .5 Ω | 11 Ω | 3.1 MEG. |
| 2 | 12SK7GT | 160 KΩ | 65 Ω | 0 Ω | 3.1 MEG. | 0 Ω | 25 KΩ | 54 Ω | 25 KΩ |
| 3 | 12SQ7GT | 160 KΩ | 4 MEG. | 0 Ω | 630 KΩ | 3.1 MEG. | 175 KΩ | 11 Ω | 0 Ω |
| 4 | 50L6GT | INF. | 110 Ω | 25 KΩ | 25 KΩ | 200 KΩ | INF. | 65 Ω | 145 Ω |
| 5 | 35Z5GT | INF. | 135 Ω | 130 Ω | 25 KΩ | 165 Ω | INF. | 110 Ω | 25 KΩ |

THE COOPERATION OF THE MANUFACTURER OF THIS
RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY
ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

472-7

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

# PARTS LIST
# AND
# INSTRUCTIONS
# FOR
# INSTALLING & OPERATING
# YOUR
# SILVERTONE

## NO. 101.535

THIS IS THE IDENTIFICATION NUMBER OF YOUR RADIO. IT WILL BE FOUND AT THE REAR OF THE CHASSIS.

ALWAYS MENTION THIS IDENTIFICATION NUMBER IN COMMUNICATING WITH US REGARDING THIS RADIO OR WHEN ORDERING REPAIR PARTS.

## EIGHT TUBE SUPERHETERODYNE
## WITH PUSH BUTTON TUNING

### IMPORTANT

PLEASE READ THESE INSTRUCTIONS VERY CAREFULLY BEFORE OPERATING YOUR RADIO.

THE INSTRUCTIONS TELL YOU:

① HOW TO INSTALL AND OPERATE YOUR RADIO PROPERLY SO THAT YOU WILL HAVE THE FINEST POSSIBLE RECEPTION.

② HOW TO KEEP YOUR RADIO IN GOOD CONDITION.

③ HOW TO OBTAIN PROPER SERVICE ATTENTION SHOULD YOU EVER REQUIRE IT.

IF YOU FOLLOW THE INSTRUCTIONS CAREFULLY YOU WILL BE ASSURED OF THE FINE PERFORMANCE AND CONTINUED SATISFACTION BUILT INTO ALL SILVERTONE RADIOS.

SEARS, ROEBUCK AND CO.

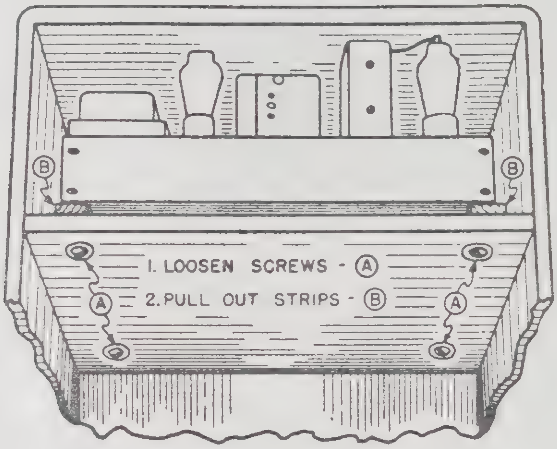
KEEP THIS BOOKLET. IT CONTAINS VALUABLE SERVICE INFORMATION

# INSTALLATION

## PREPARING THE RECEIVER FOR INSTALLATION:

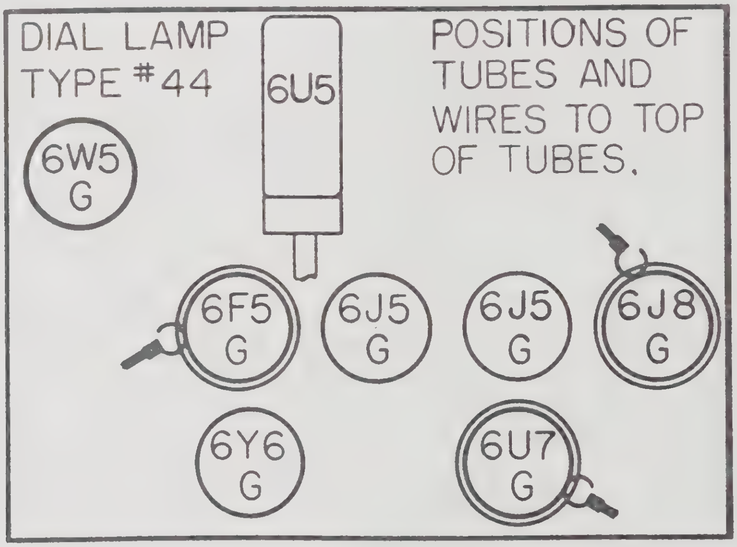
Loosen the four screws, marked "A" in the Illustration, that will be found under the chassis mounting shelf.

Pull out the two wooden strips, marked "B" in the Illustration, from between the chassis and the chassis shelf. These strips are for shipping purposes only and must be removed for proper operation of the receiver.



## TUBES:

Be sure that each of the tubes is pushed all the way down in its proper socket, indicated in the Illustration, and that the tube shields are in place. The wire leads with clips at their ends must be attached to the small metal caps on the top of those tubes requiring them.



## LOCATION:

The receiver should be put on a level surface, near an electric outlet. Do not place the receiver near a radiator or other heater since the cabinet may be damaged. If the receiver is placed against a wall, allow an inch or two of space between the back of the cabinet and the wall. This will insure the best tone quality.

## POWER SUPPLY:

The receiver is designed for operation from 105-135 volt alternating current (AC) supply only. The proper frequency (cycles) is specified on the label at the rear of the chassis. Never connect the receiver to any supply having a lower frequency or higher voltage than that specified on the label. If you are not sure of the power supply voltage and frequency at your home, your Power Company will furnish the information.

SILVERTONE TUBES ARE MATCHED TO SILVERTONE RADIOS.
FOR BEST RESULTS RE-TUBE WITH SILVERTONE TUBES.

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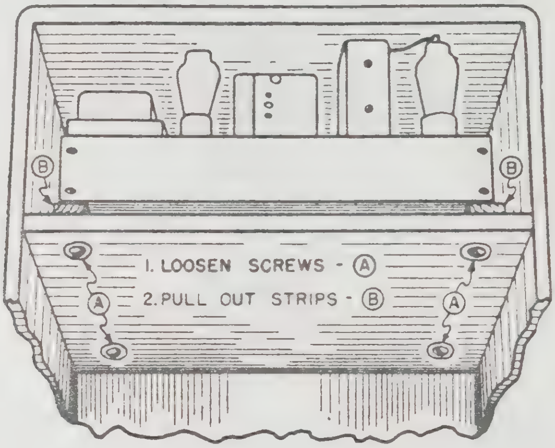

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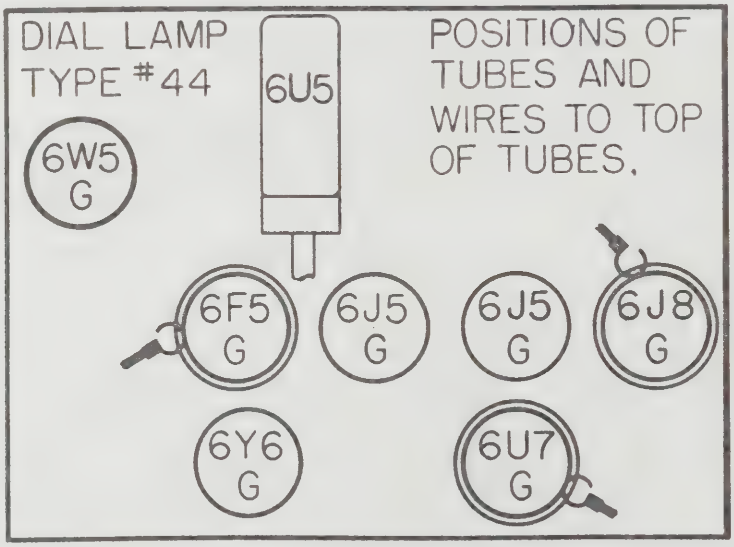

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FOR BEST RESULTS RE-TUBE WITH SILVERTONE TUBES.

# PARTS LIST, WIRING DIAGRAM, AND ALIGNMENT CHART FOR USE BY PROFESSIONAL SERVICE MEN.

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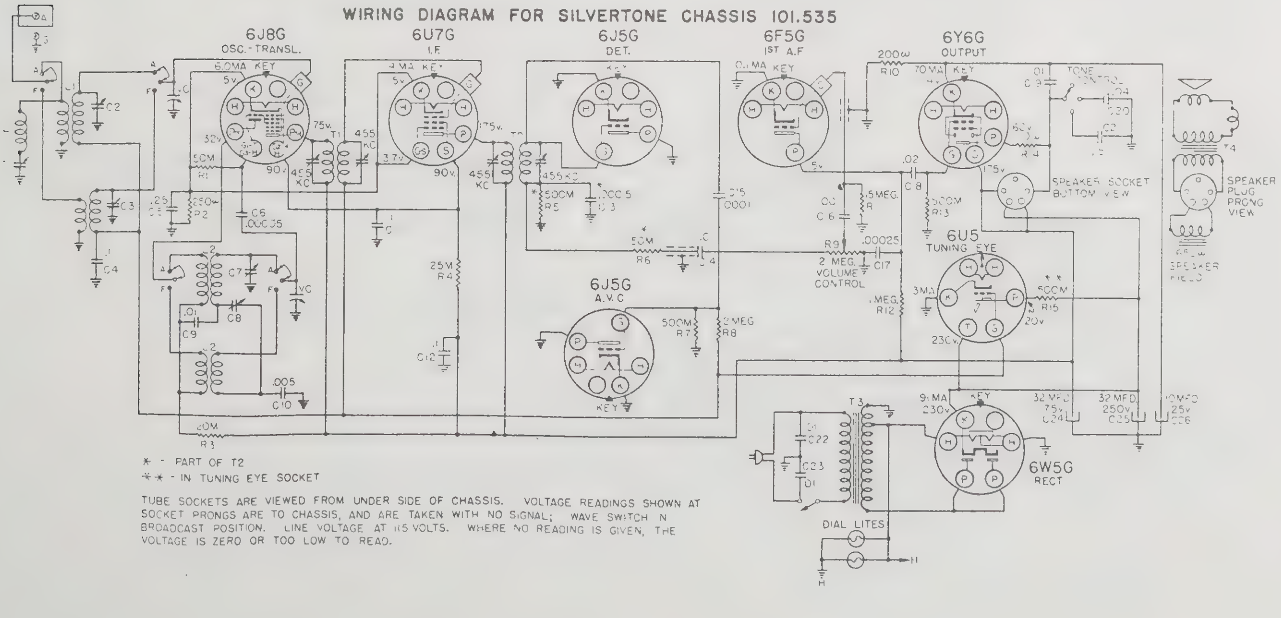
2. The IDENTIFICATION NUMBER of your radio, which is 101.535 This number will be found at the rear of the chassis.

| SCHEMATIC LOCATION | PART NUMBER | DESCRIPTION |
|---|---|---|
| | 1015517998 | Board - Antenna terminal |
| | 1015418443 | Button - Push |
| | 1015413961 | Button - Snap-in, dial mtg. |
| | 1015518322 | Cable - Tuning eye, with soc. |
| | 1015416503 | Clip - Retaining, pointer drive shaft |
| | 1015418150 | Clip - Grid |
| | 1011818198 | Clip - Dial light socket |
| L1 | 1012818176 | Coil - Antenna |
| L2 | 1012818524 | Coil - Oscillator |
| VC | 1011618255 | Condenser - Variable |
| C24,C25,C26 | 1012019192 | Condenser - Dry, elect. |
| C8 | 1011718463 | Condenser - Padder |
| C1,C2,C3 | 1011718499 | Condenser - Trim.,triple,ant. |
| C7 | 1011718145 | Condenser - Trimmer |
| C5 | | Condenser - .25 mfd.,200 v. |
| C21 | | Condenser - .15 mfd.,400 v. |
| C4,C11,C12 | | Condenser - .1 mfd.,200 v. |
| C20 | | Condenser - .04 mfd.,400 v. |
| C18 | | Condenser - .02 mfd.,400 v. |
| C22,C23 | | Condenser - .01 mfd., 600 v., dual |
| C14,C19 | | Condenser - .01 mfd.,400 v. |
| C9 | | Condenser - .01 mfd.,200 v. |
| C10 | | Condenser - .005 mfd.,mica |
| C16 | | Condenser - .001 mfd.,400 v. |
| C17 | | Condenser - .00025 mfd.,mica |
| C15 | | Condenser - .0001 mfd.,mica |
| C6 | | Condenser - .00005 mfd.,mica |
| | 1014618451 | Cone - Rubber,ptr.drive shaft |
| R9 | 1012418259 | Control - Volume |
| | 1015519280 | Cord - Power |
| | 10154185461 | Coupling - Flexible,cond.drive |
| | 1014019928 | Dial - Station |
| | 10145183581 | Drum - Pointer drive |
| | 10144184851 | Escutcheon - Push button |
| | 1014418486 | Escutcheon - Dial |
| | 1013918593 | Knob - Tuning |
| | 1013918594 | Knob - Volume |
| | 1013918595 | Knob - Wave switch |
| | 1013918596 | Knob - Tone |

| SCHEMATIC LOCATION | PART NUMBER | DESCRIPTION |
|---|---|---|
| | 1014914914 | Lamp - Dial, type #44 |
| | 1015919235 | Leaflet - Instruction |
| | 1015915947 | Log - Station |
| | 1015418987 | Mask - Light, push button escutcheon |
| | 1014119743 | Pointer - Dial |
| | 1015418245 | Pulley |
| R11 | | Resistor - 15 megohms,1/3 w. |
| R8 | | Resistor - 2 megohms,1/3 w. |
| R12 | | Resistor - 1 megohm,1/3 w. |
| R7,R13 | | Resistor - 500M ohms,1/3 w. |
| R1 | | Resistor - 50M ohms,1/3 w. |
| R4 | | Resistor - 25M ohms,1/3 w. |
| R3 | | Resistor - 20M ohms,1/3 w. |
| R2 | | Resistor - 250 ohms,1/3 w. |
| R10 | | Resistor - 200 ohms, 2 w. |
| R14 | | Resistor - 10 ohms,1/3 w. |
| | 1014618252 | Shaft - Pointer drive |
| | 1014018487 | Sheets - Station call letter |
| | 1011817987 | Socket - 8 prong |
| | 1011817986 | Socket - 7 prong |
| | 1011817985 | Socket - 6 prong |
| | 1011817982 | Socket - 5 prong |
| | 1015819936 | Speaker - 10" Dynamic |
| | 1015719937 | Cone and voice coil |
| | 1011519941 | Field coil |
| T4 | 1011319938 | Transformer |
| | 1015819227 | Speaker - 8" Dynamic |
| | 1015719228 | Cone and voice coil |
| | 1011519229 | Field coil |
| T4 | 1011319230 | Transformer |
| | 1015418251 | Spring - Tension, pointer drive string |
| | 10154183431 | String - Pointer drive, with spring |
| | 1013818265 | Switch - On-off and tone |
| | 1013718266 | Switch - Wave |
| T1 | 10133182621 | Transformer - IF Input |
| T2 | 1013518263 | Transformer - IF Output |
| T3 | 1011019193 | Transformer - Power, 60 cycle |
| T3 | 1011119194 | Transformer - Power, 25 cycle |
| | 1015418323 | Tuner - Push button |

WIRING DIAGRAM FOR SILVERTONE CHASSIS 101.535



* - PART OF T2

** - IN TUNING EYE SOCKET

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL; WAVE SWITCH IN BROADCAST POSITION. LINE VOLTAGE AT 115 VOLTS. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.

## ALIGNMENT PROCEDURE

PRELIMINARY:

Output meter connection . . . . . . . . . . . . . . . . . . . . . Across loud speaker voice coil

Output meter reading to indicate 500 milliwatts . . . . . . . . . . . . . . . . . . 1.05 volts

Generator ground lead connection . . . . . . . . . . . . . . . . . . . . . . . .Receiver chassis

Dummy antenna value to be in series with generator output . . . . . . . . . .See chart below

Connection of generator output lead . . . . . . . . . . . . . . . . . . . . .. See chart below

Generator modulation . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 30%, 400 cycles

Position of Volume Control . . . . . . . . . . . . . . . . . . . . . . . . . Fully clockwise

Position of Tone Control . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . HI

Position of Dial Pointer with variable fully closed . . . . . . Center of first mark to left of 550 kc calibration mark.

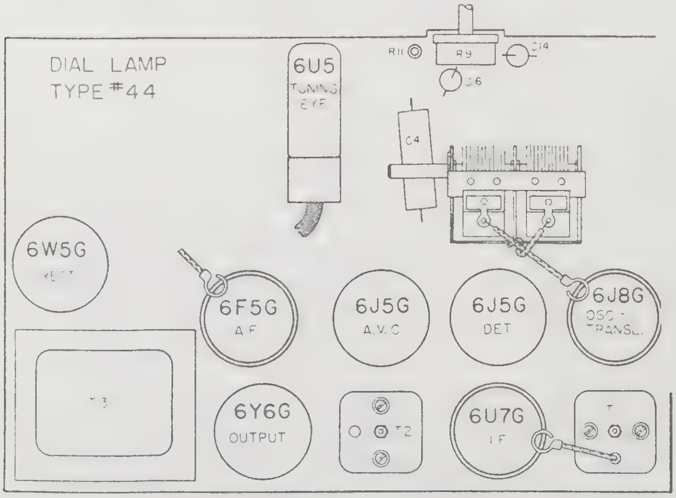
| WAVE BAND SWITCH POSITION | POSITION OF VARIABLE | GENERATOR FREQUENCY | DUMMY ANTENNA | GENERATOR CONNECTION | TRIMMERS ADJUSTED (IN ORDER SHOWN) | TRIMMER FUNCTION |
|---|---|---|---|---|---|---|
| "AM" | Closed | 455 kc | .1 mfd. | 6J8G Grid | T2,T1 | IF Output<br>IF Input |
| "AM" | 600 kc | 455 kc* | .0002 mfd. | Ant. Term. | C1* | Wave Trap |
| "AM" | 1400 kc | 1400 kc | .0002 mfd. | Ant. Term. | C7,C2 | Osc.,Transl. |
| "AM" | 600 kc (rock) | 600 kc | .0002 mfd. | Ant. Term. | C8 | Padder |
| "FOR" | 15 mc (rock) | 15 mc | 400 ohms | Ant. Term. | C3 | Transl. |

### IMPORTANT ALIGNMENT NOTES

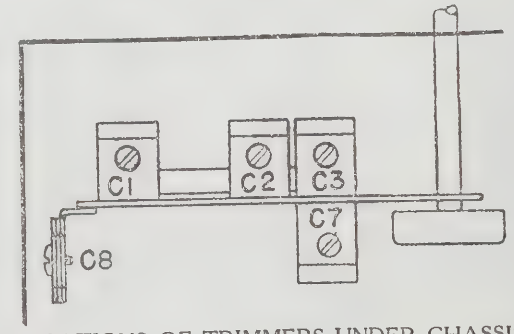
* The generator should be adjusted for high output. The trimmer should be adjusted for minimum output meter reading instead of the usual maximum reading. If the frequency of an interfering station around 455 kc is known, the generator should be adjusted to the frequency of that station instead of to 455 kc.

Where indicated by the word, "Rock", the variable should be rocked back and forth a degree or two while making the adjustment.

The alignment procedure should be repeated stage by stage, in the original order, for greatest accuracy. Always keep the output from the test oscillator at its lowest possible value to make the AVC action of the receiver ineffective.



LOCATIONS OF PARTS ON TOP OF CHASSIS.



LOCATIONS OF TRIMMERS UNDER CHASSIS

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| C24,C25,C26 | 1012019192 | Condenser - Dry, elect. |
| C8 | 1011718463 | Condenser - Padder |
| C1, C2, C3 | 1011718499 | Condenser - Trim., triple, ant. |
| C7 | 1011718145 | Condenser - Trimmer |
| C5 | | Condenser - .25 mfd., 200 v. |
| C21 | | Condenser - .15 mfd., 400 v. |
| C4, C11, C13 | | Condenser - .1 mfd., 200 v. |
| C20 | | Condenser - .04 mfd., 400 v. |
| C18 | | Condenser - .02 mfd., 400 v. |
| C22, C23 | | Condenser - .01 mfd., 600 v., dual |
| C14, C19 | | Condenser - .01 mfd., 400 v. |
| C9 | | Condenser - .01 mfd., 200 v. |
| C10 | | Condenser - .005 mfd., mica |
| C16 | | Condenser - .001 mfd., 400 v. |
| C17 | | Condenser - .00025 mfd., mica |
| C15 | | Condenser - .0001 mfd., mica |
| C6 | | Condenser - .00005 mfd., mica |
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| R9 | 1012418259 | Control - Volume |
| | 1015519280 | Cord - Power |
| | 10154185461 | Coupling - Flexible, cond. drive |
| | 1014019928 | Dial - Station |
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| | 10144184851 | Escutcheon - Push button |
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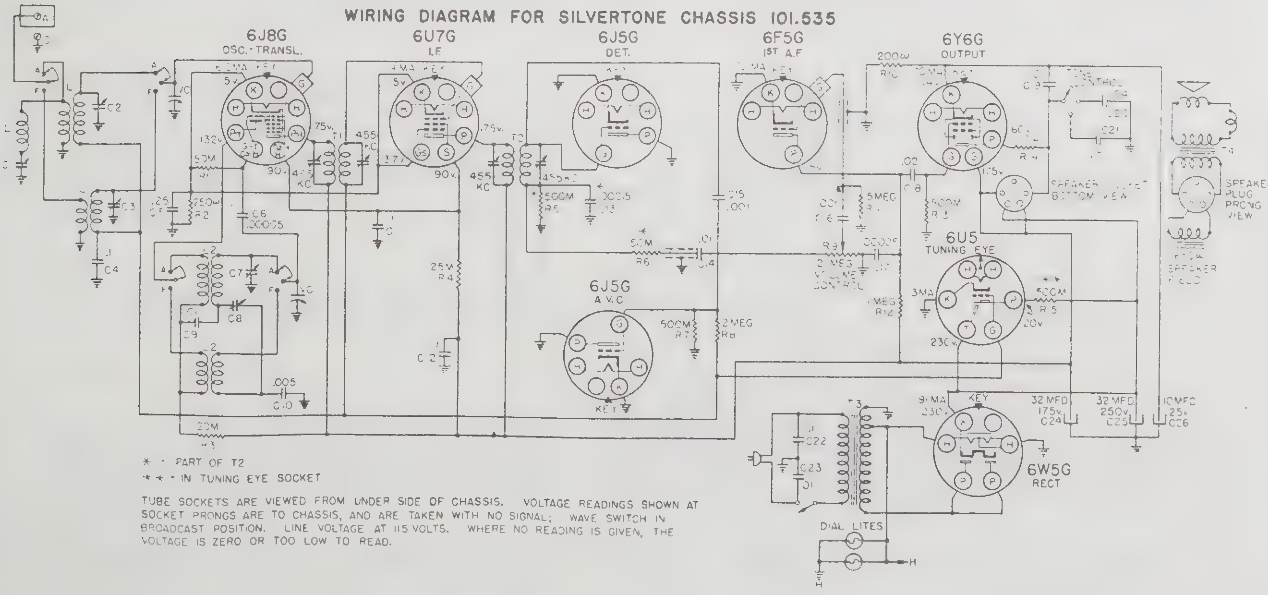
| SCHEMATIC LOCATION | PART NUMBER | DESCRIPTION |
|---|---|---|
| | 1014914914 | Lamp - Dial, type #44 |
| | 1015919235 | Leaflet - Instruction |
| | 1015915947 | Log - Station |
| | 1015418987 | Mask - Light, push button escutcheon |
| | 1014119743 | Pointer - Dial |
| | 1015418245 | Pulley |
| R11 | | Resistor - 15 megohms, 1/3 w. |
| R8 | | Resistor - 2 megohms, 1/3 w. |
| R12 | | Resistor - 1 megohm, 1/3 w. |
| R7, R13 | | Resistor - 500M ohms, 1/3 w. |
| R1 | | Resistor - 50M ohms, 1/3 w. |
| R4 | | Resistor - 25M ohms, 1/3 w. |
| R3 | | Resistor - 30M ohms, 1/3 w. |
| R2 | | Resistor - 250 ohms, 1/3 w. |
| R10 | | Resistor - 300 ohms, 3 w. |
| R14 | | Resistor - 10 ohms, 1/3 w. |
| | 1014618252 | Shaft - Pointer drive |
| | 1014018487 | Sheets - Station call letter |
| | 1011817987 | Socket - 8 prong |
| | 1011817986 | Socket - 7 prong |
| | 1011817985 | Socket - 6 prong |
| | 1011817982 | Socket - 5 prong |
| | 1015819936 | Speaker - 10" Dynamic |
| | 1015719937 | Cone and voice coil |
| | 1011519941 | Field coil |
| T4 | 1011319938 | Transformer |
| | 1015819227 | Speaker - 8" Dynamic |
| | 1015719228 | Cone and voice coil |
| | 1011519229 | Field coil |
| T4 | 1011319230 | Transformer |
| | 1015418251 | Spring - Tension, pointer drive string |
| | 10154183431 | String - Pointer drive, with spring |
| | 1013818265 | Switch - On-off and tone |
| | 1013718266 | Switch - Wave |
| T1 | 10133182621 | Transformer - IF Input |
| T2 | 1013518263 | Transformer - IF Output |
| T3 | 1011019193 | Transformer - Power, 60 cycle |
| T3 | 1011119194 | Transformer - Power, 25 cycle |
| | 1015418323 | Tuner - Push button |

## WIRING DIAGRAM FOR SILVERTONE CHASSIS 101.535



* - PART OF T2
** - IN TUNING EYE SOCKET

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL; WAVE SWITCH IN BROADCAST POSITION. LINE VOLTAGE AT 115 VOLTS. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.

## ALIGNMENT PROCEDURE

PRELIMINARY:

| | |
|---|---|
| Output meter connection | Across loud speaker voice coil |
| Output meter reading to indicate 500 milliwatts | 1.05 volts |
| Generator ground lead connection | Receiver chassis |
| Dummy antenna value to be in series with generator output | See chart below |
| Connection of generator output lead | See chart below |
| Generator modulation | 30%, 400 cycles |
| Position of Volume Control | Fully clockwise |
| Position of Tone Control | HI |
| Position of Dial Pointer with variable fully closed | Center of first mark to left of 550 kc calibration mark. |

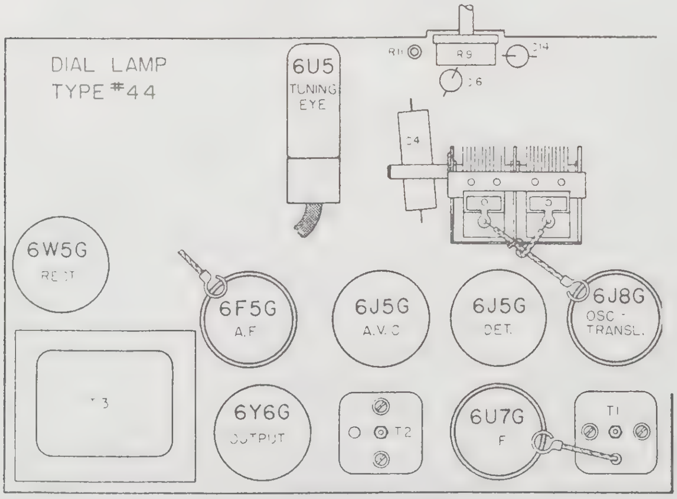
| WAVE BAND SWITCH POSITION | POSITION OF VARIABLE | GENERATOR FREQUENCY | DUMMY ANTENNA | GENERATOR CONNECTION | TRIMMERS ADJUSTED (IN ORDER SHOWN) | TRIMMER FUNCTION |
|---|---|---|---|---|---|---|
| "AM" | Closed | 455 kc | .1 mfd. | 6J8G Grid | T2,T1 | IF Output<br>IF Input |
| "AM" | 600 kc | 455 kc* | .0002 mfd. | Ant. Term. | C1* | Wave Trap |
| "AM" | 1400 kc | 1400 kc | .0002 mfd. | Ant. Term. | C7,C2 | Osc.,Transl. |
| "AM" | 600 kc (rock) | 600 kc | .0002 mfd. | Ant. Term. | C8 | Padder |
| "FOR" | 15 mc (rock) | 15 mc | 400 ohms | Ant. Term. | C3 | Transl. |

### IMPORTANT ALIGNMENT NOTES

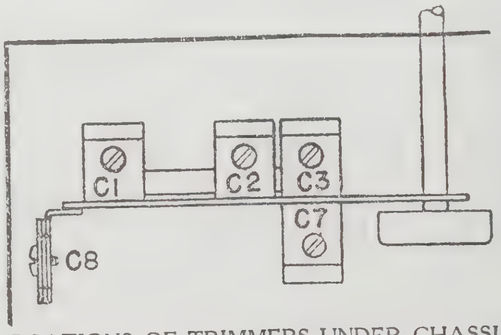
* The generator should be adjusted for high output. The trimmer should be adjusted for minimum output meter reading instead of the usual maximum reading. If the frequency of an interfering station around 455 kc is known, the generator should be adjusted to the frequency of that station instead of to 455 kc.

Where indicated by the word, "Rock", the variable should be rocked back and forth a degree or two while making the adjustment.

The alignment procedure should be repeated stage by stage, in the original order, for greatest accuracy. Always keep the output from the test oscillator at its lowest possible value to make the AVC action of the receiver ineffective.



LOCATIONS OF PARTS ON TOP OF CHASSIS.



LOCATIONS OF TRIMMERS UNDER CHASSIS

20363

# NOTES ON SHORT WAVE RECEPTION

### YOUR SILVERTONE MUST BE INSTALLED AND OPERATED CORRECTLY:

Explicit instructions are given in this Leaflet for properly installing and operating your receiver. Be sure to read and follow these instructions very carefully.

**YOU MUST USE AN OUTSIDE ANTENNA TO HEAR FOREIGN AND DOMESTIC STATIONS WITH THE GREATEST SATISFACTION**

### HOW THE TIME OF DAY AFFECTS SHORT WAVE RECEPTION:

Short Wave stations cannot be tuned in at any point of the dial at any time of the day. One reason is the *difference in time* between the United States and foreign countries. This difference in time must be remembered constantly in order to determine whether or not it is a likely time of day for the foreign station to be broadcasting. For instance, when it is 11 o'clock at night in New York City, it is 4 o'clock in the morning of the *next* day in London and Paris. Ordinarily, stations would not be broadcasting at 4 o'clock in the morning.

Some of the German and British stations broadcast programs especially intended for the United States. These programs can be received during evening hours and up to midnight (Eastern Standard Time) even though it is early morning in those countries. However, most foreign stations must be listened for when it is known that they are broadcasting. Therefore, a short wave "Log" or "Timetable" is of great assistance in picking up foreign stations. Short Wave reception during daylight hours will be best at frequencies higher than about 12 mc. Night time reception will be best at frequencies lower than about 12 mc.

### SOME REASONS FOR POOR RECEPTION:

You may have carefully observed all of the points mentioned in the preceding paragraphs and still find reception unsatisfactory at times. The reasons are mentioned below. They are due to natural phenomena and are in no way the fault of the receiver. All short wave receivers in your locality will be similarly affected --- a fact easily verified by conversation with those of your neighbors who have short wave receivers.

*Fading* is very much more pronounced on short waves. Quite often it is very rapid, making the voice or music seem to flutter. Sometimes it is slow, bringing the station in very strongly and clearly for a few minutes and then letting it die away so that it becomes almost inaudible. (The increase in noise that occurs as the station fades away is normal and is due to the Automatic Volume Control of the receiver, increasing its sensitivity to compensate for the decreased signal strength from the station.)

*Atmospheric conditions,* sometimes lasting for several days, occasionally prevent satisfactory short wave reception. An illustration of this, familiar to everybody, is the following: Often short wave programs are re-broadcast by the national networks over their broadcast chain hook-ups. The short wave receiving apparatus used for this purpose costs thousands of dollars. Special multiple antennas covering acres of ground are installed. The equipment is manned and operated by highly skilled technicians. But, in spite of all this, the announcer often is compelled to break the program "because of unsatisfactory atmospheric conditions".

## CONDITIONS AFFECTING RECEPTION

There are natural causes that sometimes prevent perfect reception. The more common of them are:

### STATIC:

Static is due to electrical discharges in the atmosphere. It is heard in the radio as a crackling or frying noise. It is especially noticeable during the Summer when thunderstorms are frequent. Thunderstorms may cause static hundreds of miles away from the location of the storm. Snow storms in Winter also are a cause of static. Most local stations are strong enough to override static although static will interfere with distant reception.

### LOCAL ELECTRICAL INTERFERENCE:

Any electrical appliance that creates an electric spark during its operation may cause a noise that sounds very much like static. Vacuum cleaners, electric motors, some types of electric refrigerators, electric flat irons with automatic heat regulators, etc., are some of the common household appliances that may cause interference. X-ray machines, flashing electric signs, trolley cars and medical diathermy machines often cause interference over a wide area.

### FADING:

Fading is a natural occurrence that causes the program to vary in volume and tonal quality. It is especially noticeable with distant reception.

### STATION INTERFERENCE:

There are over 600 broadcasting stations in the United States, but only 95 channels available for them. Therefore, many stations must share the same channel or frequency. This makes it impossible to have clear reception when tuned to these frequencies unless one of the stations is so much stronger than the others that it drowns the others out. The condition occurs particularly at the "1700" end of the AMERICAN scale and is heard as whistles, squeals or growls.

**SHORT WAVE TUNING IS DIFFERENT - READ SUGGESTIONS ABOVE.**

## NORMAL CARE AND MAINTENANCE REQUIRED

No adjustment or oiling of any kind is required on the chassis or speaker.

TUBES:

To maintain the radio at top notch efficiency, it is advisable to have the tubes tested every six months. They can be taken to any Sears' Retail Store for free testing.

DIAL LAMPS:

Six volt miniature base dial lamps are used. The dial lamp sockets are attached to the dial mechanism by means of a spring clip. To replace a dial lamp, switch the receiver off. Then pull the spring clip off the dial mechanism and replace the lamp with another of the same type. The illustration on Page two shows the lamp type number.

ANTENNA AND GROUND:

It is advisable to have a Sears' service man make a periodic inspection of the antenna and ground system, perhaps once a year. All connections should be checked to be sure that they are clean and tight, that no wires are broken, and that the antenna is well insulated from the ground at all points.

## IF THE RECEIVER FAILS TO OPERATE PROPERLY

Carefully re-read this Instruction Leaflet to be sure that the receiver has been installed properly and that it is being operated correctly

Be sure that the radio power cord plug is making good contact in its receptacle.

Carefully check the antenna and ground installation.

Be sure that all of the tubes are pushed all the way down in their sockets and that the clips at the ends of the flexible wires are firmly attached to the small metal caps on the top of the proper tubes.

"Howling" may be caused by failure to loosen the four screws and removing the wooden strips, as described on Page two of this Leaflet.

Remove the tubes and have them tested at a Sears' Retail Store or a local radio dealer.

If you purchased your radio from a Sears' Retail Store and it does not operate properly after you have followed these suggestions, call the Radio Service Department. Sears' Retail Stores are fully equipped to handle your service requirements.

If you purchased your radio from Sears by Mail Order, fill out the questionnaire packed with the receiver and mail it to the Sears' branch from which you ordered your radio. We will then advise what further action to take.

The Schematic Wiring Diagram and Authorized Parts List that follow are for use by a professional radio service man. Stickers showing the Schematic Wiring Diagram and Parts List are also pasted in the cabinet.

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## THE WAVE BAND SWITCH:

This knob has two positions marked by the letters, "AM" and "FOR".

Position "AM" is used for reception of AMERICAN broadcasting stations and certain POLICE broadcasts. These stations use frequencies between approximately 550 kc (kilocycles) and 1700 kc.

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## READING THE DIAL SCALES:

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Reception on the FOREIGN band usually is best between 12 and 18 mc in the daytime and best between 6 and 12 mc at night.

Many Short Wave stations operate only on certain days of the week and only during certain hours of the day. Therefore, it is necessary to know when to tune for particular FOREIGN stations. Short Wave "Logs" or "Timetables" list frequencies, locations and operating schedules of foreign stations. Tuning for stations on these bands must be done very much more slowly and carefully than is necessary for stations on the AMERICAN band. Be sure to read the helpful NOTES ON SHORT WAVE RECEPTION, that follow.

## THE VOLUME CONTROL:

Turning this knob to the left decreases volume; to the right increases volume. When the station has been tuned in properly, the Volume Control knob should be turned to the point giving the desired volume. Never attempt to reduce volume by detuning the station with the Station Selector Knob. Always use this Volume Control knob.

## THE AUTOMATIC VOLUME CONTROL ACTION:

When the Volume Control knob has been adjusted for the desired volume from any particular station, the Automatic Volume Control feature of the receiver will tend to maintain the volume at this same value for other stations. It does this by automatically changing the sensitivity of the receiver to compensate for changes in the strength of the signal received from different broadcasting stations. In some locations noise may be encountered as the receiver is tuned between stations. This noise is normal and is due to the automatic increase in the sensitivity of the receiver. When listening to weak and distant stations, the tone may become distorted at times. This is normal and is due to fading of the station beyond the limits which can be compensated for by the Automatic Volume Control. .

**AND ENJOY FINE RECEPTION.**

# PUSH BUTTON TUNING

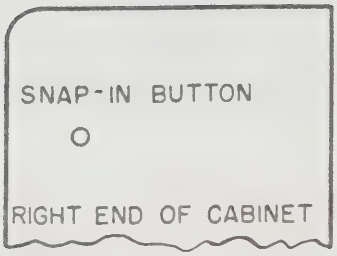
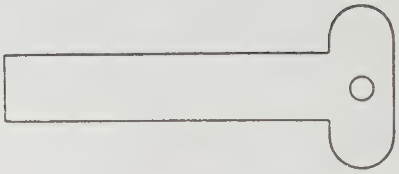


FIG. 1



KEY FOR LOCKING AND
UNLOCKING PUSH-BUTTON
MECHANISM.

FIG. 2

### SETTING UP:

Leave the radio turned on for about 15 minutes before adjusting the push buttons. This "warming up" period will insure permanent and accurate settings.

1. Make a list of the stations that you want to set up for push button tuning. It is advisable, but not necessary, to arrange the stations in the order of their frequency (kilocycles); that is, the station of lowest frequency will be #1, the station of next higher frequency #2, etc. The top left push button can be used for station #1, the lower left one for station #2, the next upper one for station #3, etc. If you wish, short wave stations that can be tuned in on the SPREAD BAND scale can be set up for push button tuning. The stations selected must give strong and reliable reception.

2. Remove the four screws that hold the plate through which the push buttons protrude, and remove the plate. (This plate is called the "escutcheon".) If your radio is a table model (not a console), remove the snap-in button at thr right side of the cabinet. See Fig.1

3. Push the tuning knob in and turn it so that the dial pointer comes to the right end of the dial. If your radio is a table model, a key, illustrated in Fig. 2, will be found in the Instruction Leaflet envelope. Insert this key in the hole in the side of the cabinet from which the snap-in button was removed and engage the key with the slot at the end of the push button locking mechanism. Unscrew (turn counter-clockwise) the key a few turns, unlocking the mechanism. (A screw driver can be used for unlocking the mechanism instead of the key supplied.)

If yours is a console model, the mechanism can be unlocked by reaching in from the back of the cabinet and unscrewing (turning counter-clockwise) the wing nut, at the end of the mechanism, a few turns. (This can be done by hand.)

4. Push the button that you wish to use for your #1 station, all the way in and hold it in firmly. Push the tuning knob in and turn it until your #1 station is tuned in exactly. Then let go of the push button, making sure not to turn the tuning knob until you have let go of the button. (Turning the knob while the button is pushed in would spoil the accuracy of the adjustment.) Be as exact as possible in tuning your station since this will determine how accurately your station will be tuned whenever you use the push button.

5. Push in your #2 button. Hold it in firmly and tune in your #2 station accurately. Then let go of the push button and then the tuning knob. Proceed in the same manner for the other stations on your list.

6. When all of the stations have been set up, push the tuning knob in and turn it so that the dial pointer comes to the left end of the dial. Then lock the mechanism by tightening (turning clockwise) the wing nut for console models or by using the key for table models. If yours is a table model, replace the snap-in button in the side of the cabinet.

7. Punch out the call letters of your desired stations from the call letter sheets supplied. Insert the call letters in the celluloid holders at the back of the escutcheon. Be sure to insert the call letters so that they are opposite their respective push buttons. Then replace the escutcheon.

8. You may change your choice of stations at any time by unlocking the mechanism as described in Step 3 and adjusting the button to the new station, as described in Step 4. Then relock the mechanism as described in Step 6. The call letters of the new station should be inserted in the call letter holder in their proper position.

### OPERATION:

Push the button, indicated for your desired station, all the way in. Your station then will be tuned in. If you have selected short wave stations for approximate push button tuning, be sure the band switch is turned to the proper band.

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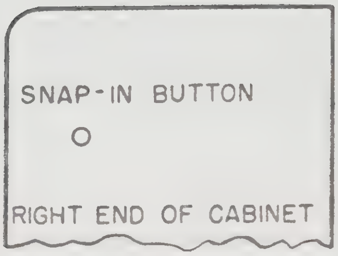
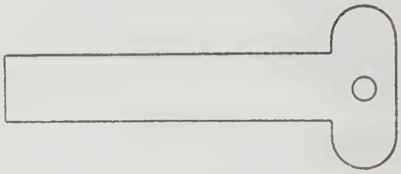


FIG. 1



KEY FOR LOCKING AND UNLOCKING PUSH-BUTTON MECHANISM.

FIG. 2

## SETTING UP:

Leave the radio turned on for about 15 minutes before adjusting the push buttons. This "warming up" period will insure permanent and accurate settings.

1. Make a list of the stations that you want to set up for push button tuning. It is advisable, but not necessary, to arrange the stations in the order of their frequency (kilocycles); that is, the station of lowest frequency will be #1, the station of next higher frequency #2, etc. The top left push button can be used for station #1, the lower left one for station #2, the next upper one for station #3, etc. If you wish, short wave stations that can be tuned in on the SPREAD BAND scale can be set up for push button tuning. The stations selected must give strong and reliable reception.

2. Remove the four screws that hold the plate through which the push buttons protrude, and remove the plate. (This plate is called the "escutcheon".) If your radio is a table model (not a console), remove the snap-in button at thr right side of the cabinet. See Fig.1

3. Push the tuning knob in and turn it so that the dial pointer comes to the right end of the dial. If your radio is a table model, a key, illustrated in Fig. 2, will be found in the Instruction Leaflet envelope. Insert this key in the hole in the side of the cabinet from which the snap-in button was removed and engage the key with the slot at the end of the push button locking mechanism. Unscrew (turn counter-clockwise) the key a few turns, unlocking the mechanism. (A screw driver can be used for unlocking the mechanism instead of the key supplied.)

If yours is a console model, the mechanism can be unlocked by reaching in from the back of the cabinet and unscrewing (turning counter-clockwise) the wing nut, at the end of the mechanism, a few turns. (This can be done by hand.)

4. Push the button that you wish to use for your #1 station, all the way in and hold it in firmly. Push the tuning knob in and turn it until your #1 station is tuned in exactly. Then let go of the push button, making sure not to turn the tuning knob until you have let go of the button. (Turning the knob while the button is pushed in would spoil the accuracy of the adjustment.) Be as exact as possible in tuning your station since this will determine how accurately your station will be tuned whenever you use the push button.

5. Push in your #2 button. Hold it in firmly and tune in your #2 station accurately. Then let go of the push button and then the tuning knob. Proceed in the same manner for the other stations on your list.

6. When all of the stations have been set up, push the tuning knob in and turn it so that the dial pointer comes to the left end of the dial. Then lock the mechanism by tightening (turning clockwise) the wing nut for console models or by using the key for table models. If yours is a table model, replace the snap-in button in the side of the cabinet.

7. Punch out the call letters of your desired stations from the call letter sheets supplied. Insert the call letters in the celluloid holders at the back of the escutcheon. Be sure to insert the call letters so that they are opposite their respective push buttons. Then replace the escutcheon.

8. You may change your choice of stations at any time by unlocking the mechanism as described in Step 3 and adjusting the button to the new station, as described in Step 4. Then relock the mechanism as described in Step 6. The call letters of the new station should be inserted in the call letter holder in their proper position.

## OPERATION:

Push the button, indicated for your desired station, all the way in. Your station then will be tuned in. If you have selected short wave stations for approximate push button tuning, be sure the band switch is turned to the proper band.

# ANTENNA AND GROUND REQUIREMENTS

To obtain the excellent performance of which your receiver is capable, it must not be handicapped by a faulty antenna. Often, an old antenna becomes very much impaired in efficiency even though it appears to be in good condition.

**YOU MUST USE AN OUTSIDE ANTENNA TO HEAR FOREIGN AND DOMESTIC STATIONS WITH THE GREATEST SATISFACTION**

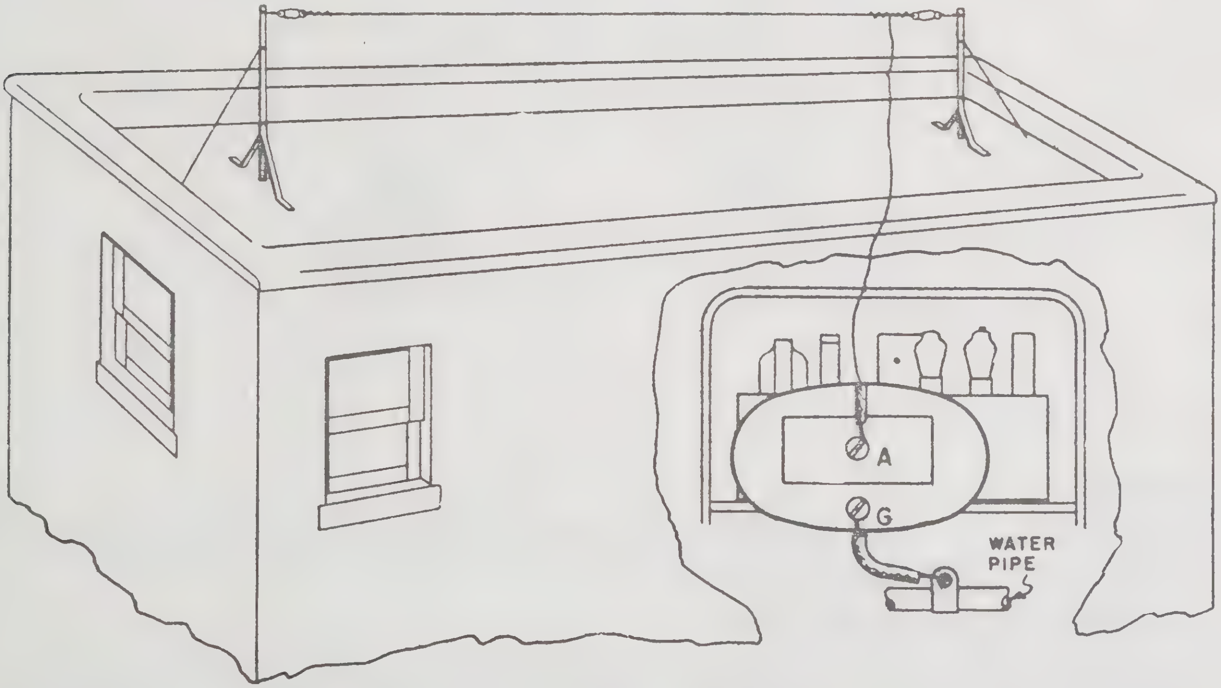
FOR BEST RECEPTION, WE RECOMMEND OUR CATALOG #5586 DELUXE DOUBLET ANTENNA KIT FOR NOISE REDUCING RECEPTION ON BROADCAST AND SHORT WAVE BANDS; OUR #5587 DOUBLET, WHICH HAS NOISE REDUCING FEATURES FOR SHORT WAVE RECEPTION; AND OUR #5588 AND #5575 CONVENTIONAL ANTENNA KITS.

### ANTENNA AND GROUND CONNECTIONS:

The leadin (wire running from outside antenna to Radio) should be fastened under the terminal screw marked, "A", at the rear of the Radio, as shown.

A good ground connection is of real importance. Firmly secure a wire to a water or steam radiator pipe, by means of a "Ground Clamp" designed for the purpose. The pipe must be thoroughly scraped so that the clamp makes contact with bright metal. If no such ground is available, a wire clamped to a piece of galvanized pipe which has been driven a few feet into moist earth, will serve. The ground wire should be fastened under the terminal marked "G", as illustrated.

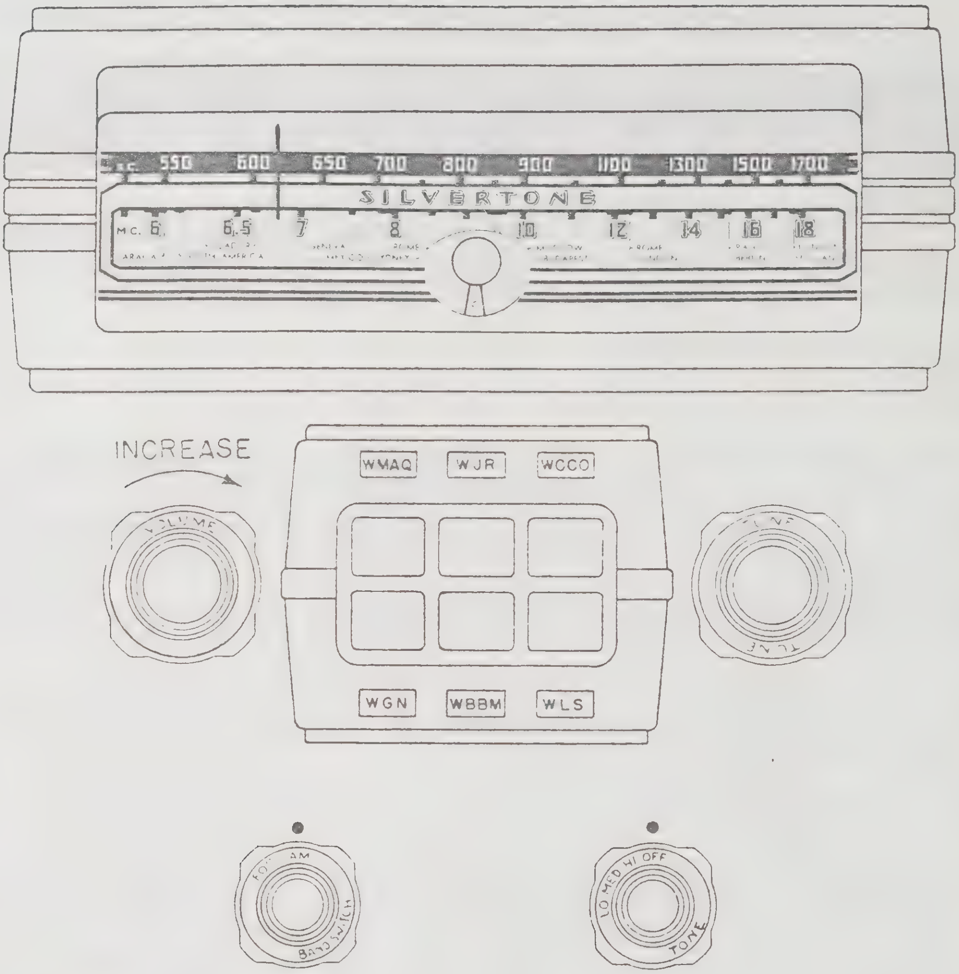
A good ground connection is particularly necessary if your radio is a 35 cycle model, to minimize electrical noises that might otherwise be picked up from the electric light line.



IF YOU BUILD YOUR OWN OUTSIDE ANTENNA OR USE AN OLD ONE ALREADY INSTALLED, MAKE IT AT LEAST 50 FEET LONG AND AS HIGH AS POSSIBLE. CHECK ALL CONNECTIONS TO MAKE SURE THEY ARE CLEAN AND SECURE.

DON'T HANDICAP YOUR RADIO WITH A QUESTIONABLE ANTENNA. INSTALL A SILVERTONE #5586, #5587, #5588, OR #5575 ANTENNA.

# OPERATION



## FOREWORD:

The operation of the receiver as a conventional receiver, that is, without the Push Button Tuning feature, will be described first. The setting up and operation of the Push Button Tuning mechanism is described later.

## THE "ON-OFF" SWITCH AND TONE CONTROL:

This knob has four positions. When it is turned all the way to the left, the receiver is switched off. The first position to the right turns the receiver on. The switch will click, the dial will become illuminated, and the receiver will be in operating condition after approximately 30 seconds, necessary for warming up.

Rotation of this knob also adjusts the tone quality. If the knob is left in the position marked, "HI", the tone will be treble or brilliant. This position is the one used ordinarily to give the most distinct reproduction. Turning the knob all the way to the right, to the marking "LO", makes the tone mellow. Some types of music sound more pleasing with the knob in this position. This position also decreases the effects of static and electrical noise. The position marked "MED" is a medium position between "HI" and "LO". Turn the knob to the position that gives the tone most pleasing to you.

## THE STATION SELECTOR KNOB:

Stations are tuned in by rotating the knob marked "TUNE". (The knob must be pushed in at the same time it is being turned.) After a desired station has been picked up, the knob should be carefully adjusted to the point affording maximum volume and most realistic reproduction.

LEARN TO OPERATE YOUR SILVERTONE PROPERLY

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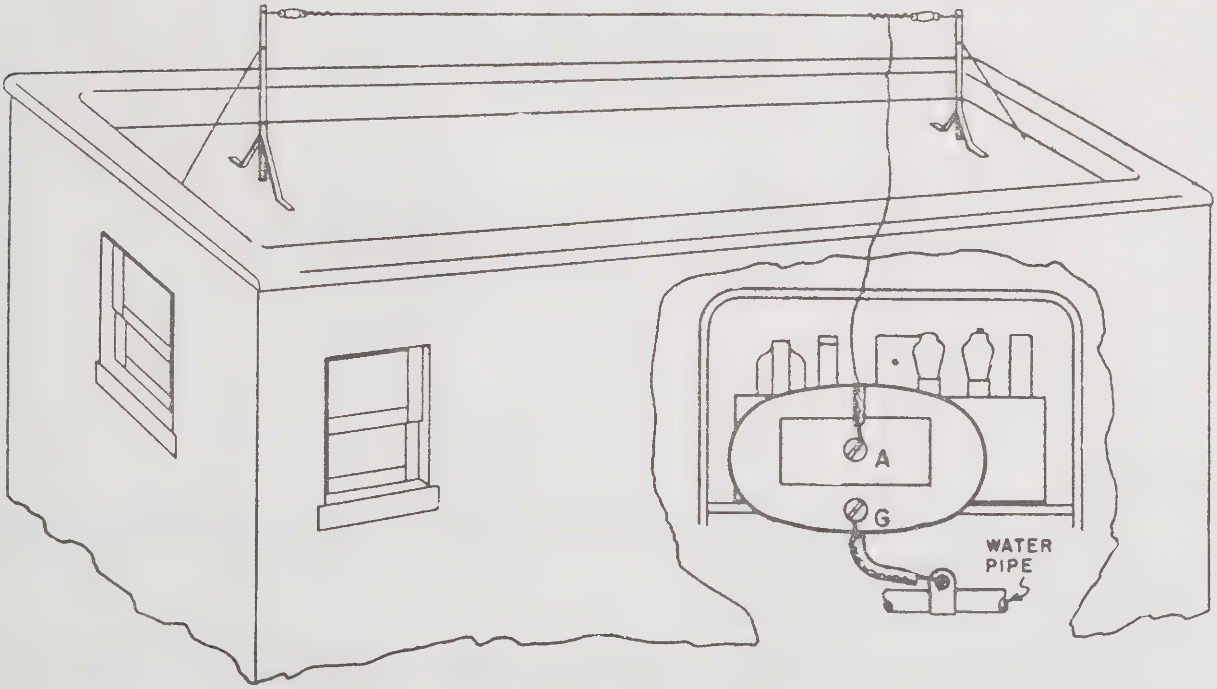

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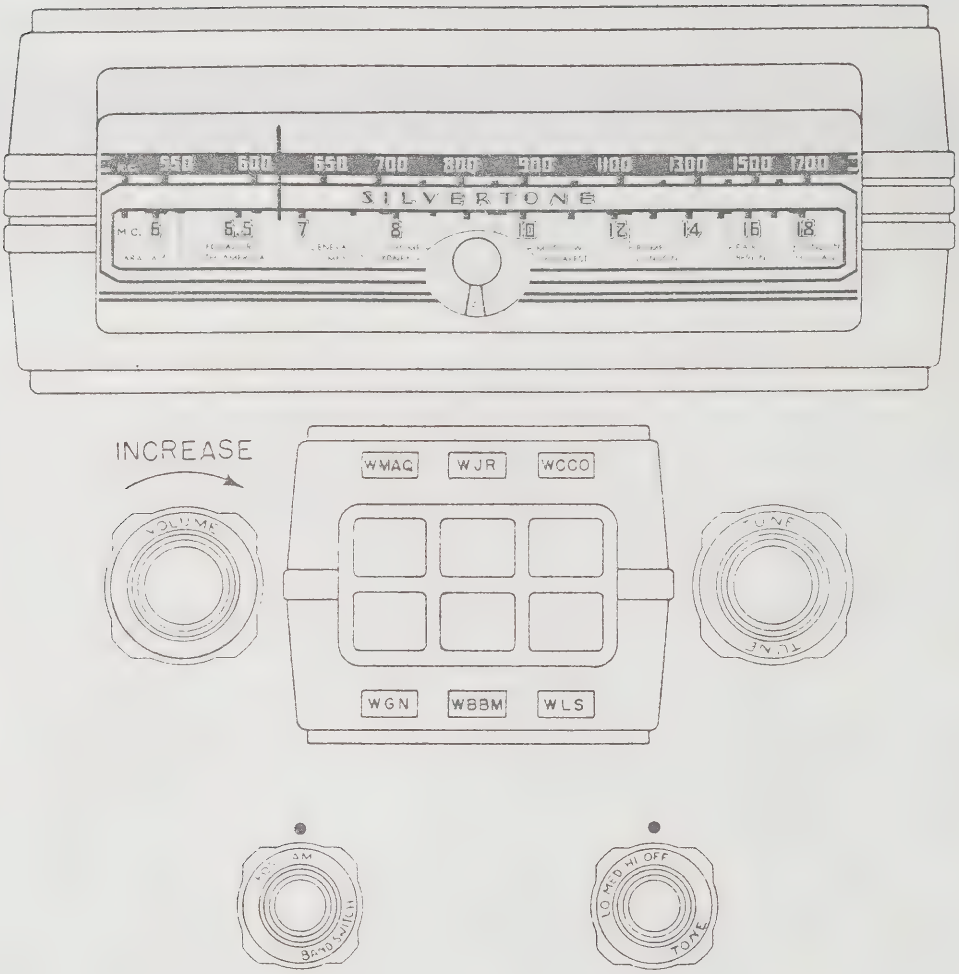

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LEARN TO OPERATE YOUR SILVERTONE PROPERLY

SILVERTONE TUBES ARE MATCHED TO SILVERTONE RADIOS.
FOR BEST RESULTS RE-TUBE WITH SILVERTONE TUBES.

SEARS, ROEBUCK AND CO.

1015919235
Rel 803,20,43

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1015919235
Rel 803,20,43

# *Silvertone*

## RADIO TIME TABLE AND LOG

*of*

## American
## Broadcast and Short Wave

*and*

## Foreign Short Wave
## Stations

**SEARS ROEBUCK & COMPANY**

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*of*

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## Broadcast and Short Wave

*and*

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## Stations

SEARS ROEBUCK & COMPANY

| WATTS POWER | 100 | 250 | 300 | 500 | 750 | 1000 | 1500 | 2000 | 2500 | 5000 | 10000 | 15000 | 25000 | 50000 | 100,000 | 250,000 | 500,000 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CODE | H | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z |

Revision 59 *Columbia; †NBC Red; ↓NBC Blue; ‡NBC Red & Blue; ^Mutual

| WESTERN<br>Wash., Ore., Cal., Utah, Etc. | MIDDLE WESTERN<br>Minn., Ia., Neb., Mo., Tex., Etc. | KILO. | Dial No. | CENTRAL<br>Ill., Mich., Ohio, Tenn., Etc. | EASTERN<br>Mass., N. Y., Pa., N. C., Etc. |
|---|---|---|---|---|---|
| CJRM Moose Jaw, Sask....O | | 540 | | | |
| [illegible] ....O<br>‡KFYR Bismarck, N. D. ..O | †KSD-KFUO St. Louis, Mo ..O<br>*KTSA San Antonio, Tex ..O | 550 | | *WKRC Cincinnati, Ohio....O<br>WSVA Staunton, Va.......M | CFNB Fredericton, N.B. M<br>*WGR Buffalo, N. Y.........O<br>WDEV Waterbury Vt.......M |
| *KLZ Denver, Colo..........O<br>*KSFO San Francisco, Cal. ..O | KWTO Springfield, Mo.....O<br>‡KFDM Beaumont, Tex.....O | 560 | | WIND Chicago-Gary.......O<br>‡WIS Columbia, S C..........O | ↓^WFIL Philadelphia, Pa... O<br>*WQAM Miami, Fla..........O |
| *KVI Tacoma, Wash..........O<br>KMTR Los Angeles, Cal. ..O | *WNAX Yankton, S. D.......O<br>‡KGKO Ft. Worth Tex. ...O | 570 | | *WKBN Youngstown, Ohio. M<br>WOSU Columbus, Ohio.....O | ‡WWNC Asheville, N. C......O<br>WMCA New York (↓WSYR) Q |
| CKUA Edmonton, Alta.....M<br>‡KMJ Fresno, Cal..........O | *WIBW Topeka, Kas.........O<br>KSAC Manhattan, Kas....M | 580 | | WILL Urbana, Ill..........O<br>*WCHS Charleston, W. Va. . M | †WTAG Worcester, Mass.... O<br>*WDBO Orlando, Fla.........O |
| †KHQ Spokane, Wash.......O | †WOW Omaha, Neb.........S | 590 | | WKZO Kalamazoo, Mich...K | *WEEI Boston, Mass.........O |
| CJOR Vancouver, B C.......M<br>↓KFSD San Diego, Cal.......M | ↓^WMT Cedar Rapids, Ia ...O<br>*WREC Memphis Tenn ....O | 600 | | ↓CFCF Montreal, Que.......M<br>CBW Windsor Ont.........M<br>CMQ Havana, Cuba. . V | ↓^WICC Bridgeport, Conn . M<br>*WCAO Baltimore, Md.... M |
| KFAR Fairbanks, Alaska ...O<br>*KFRC San Francisco, Cal. ..O | †WDAF Kansas City, Mo....O | 610 | | ^WCLE Cleveland Ohio.....M | WIP Philadelphia, Pa...... O<br>‡WIOD Miami, Fla..........O |
| *KGW Portland, Ore.........O<br>‡KTAR Phoenix, Ariz.........O | KWFT Wichita Falls, Tex....K | 620 | | ‡WTMJ Milwaukee, Wis....O<br>‡WFLA-‡WSUN Florida ...C | *^WLBZ Bangor, Maine....O<br>WHJB Greensburg, Pa .....K |
| CJRC Winnipeg, Man.....O<br>KGFX Pierre, S.D. [illegible] | KFRU Columbia, Mo.......M | 630 | | ‡WGBF Evansville, Ind.....M<br>↓WMAL Washington, D. C. K | CFCY Charlottetown, PEI..O<br>*WPRO Providence, R. I.... M |
| †KFI Los Angeles, Cal ....W | WOI Ames, Iowa...........S | 640 | | ^WHKC Columbus, Ohio...M | *WGAN Portland, Me...... M |
| | | 650 | | ‡^WSM Nashville, Tenn....W | |
| | WAAW Omaha, Nebr.......M | 660 | | XEAL Mexico City, Mex...O | †WEAF New York City...W |
| | | 670 | | †WMAQ Chicago, Ill...... W | |
| †KPO San Francisco, Cal. . W | KFEQ St. Joseph, Mo ......R | 680 | | CMBQ Havana, Cuba......S | WLAW Lawrence, Mass. . O<br>‡WPTF Raleigh, N. C.......O |
| CJCJ Calgary, Alta........M | XET Monterey, Mex.........S | 690 | | NAA Arlington, Va..........O | *CFRB Toronto, Ont.........S |
| | | 700 | | ^‡WLW Cincinnati, Ohio. . Z | |
| *KIRO Seattle, Wash...... O<br>KMPC Beverly Hills, Cal M | | 710 | | | ^WOR Newark, N. J.......W |
| | | 720 | | ^WGN Chicago, Ill. ......W | |
| CJCA Edmonton, Alta.....O | XEPN Piedras Negras, Mex. W | 730 | | CMCL Havana, ..(CMK) . T | *CKAC Montreal, Que....S |
| KTRB Modesto, Cal.......K | KMMJ Clay Center, Neb. .O | 740 | | †WSB Atlanta, Ga.........W | WHEB Portsmouth, N. H. . K |
| ‡KGU Honolulu, Hawaii....R | | 750 | | *†WJR Detroit, Mich. .....W | CMBL Havana, Cuba.......R |
| KXA Seattle, Wash.........O<br>XEOK Tia Juana, Mex ...K | WLB Minneapolis (WCAL) . S<br>WEW St. Louis, Mo .......O | 760 | | | ↓WJZ New York (WBAL) W |
| | *KFAB Lincoln, Nebr.....T | 770 | | *WBBM Chicago, Ill......W | CMBF Havana, Cuba ......S |
| KWLK Longview, Wash ...K<br>KEHE Los Angeles Cal. . O | ‡KGHL Billings, Mont......O<br>KFDY Brookings, S. D. ...O | 780 | | WPIC Sharon, Pa..........K<br>†WMC Memphis, Tenn......O | ↓^WEAN Providence, R.I....O<br>‡WTAR Norfolk, Va.........O |
| ↓KGO San Francisco, Cal. . T | ‡KOAM Pittsburg, Kas.....Q | 790 | | | †WGY Schenectady, N. Y. W |
| | ‡WFAA Dallas, (‡WBAP) . W | 800 | | HIX Santo Domingo, RD...O | WTBO Cumberland, Md. . K |
| | *WCCO Minneapolis, Min W | 810 | | | WNYC New York City.... O |
| XEBG Tia Juana, Mex.....O | | 820 | | *WHAS Louisville, Ky... W | |
| | ↓KOA Denver, Colo........W | 830 | | WRUF Gainesville, Fla.....S | WHDH Boston, Mass......O<br>WEEU Reading, Pa.........O |
| CFQC Saskatoon, Sask.....O | XERA Villa Acuna, Mex. ...Z | 840 | | | ‡CBL-CBT Toronto, Ont. W |
| KIEV Glendale, Cal.......K | *WWL New Orleans, La...W | 850 | | WKAR E. Lansing, Mich...O | *WESG Elmira, N.Y.........O |
| XEMO Tiajuana, Mex .... S | ^WHB Kansas City, Mo.....O | 860 | | | *WABC New York......W |
| | | 870 | | ↓WENR-WLS Chicago. . W | |
| KLX Oakland, Cal. ........O | WSUI Iowa City, Ia. .... M<br>KPOF Denver (^KFKA) O | 880 | | CBO Ottawa, Ont.........O<br>*WCOC Meridian, Miss.....O | *WGBI-WQAN Scranton, Pa O<br>WRNL Richmond, Va. .. M |
| *KFPY Spokane, Wash...O<br>‡KARK Little Rock, Ark... M | KFNF Shenandoah (KUSD) O<br>XEW Mexico City ...... W | 890 | | WBAA Lafayette, Ind......M<br>*WMMN Fairmont, W. Va. . O | †WJAR Providence, R. I.... M<br>*WGST Atlanta, Ga.........O |
| KGBU Ketchikan, Alaska O<br>‡KSEI Pocatello, Idaho.....K<br>^KHJ Los Angeles, Cal. ..O | WTAD Quincy, Ill..........O<br>‡WKY Okla. City, Okla.....O | 900 | | WLBL Stevens Pt., Wis. . . S<br>‡WJAX Jacksonville, Fla....O | †WBEN Buffalo, N. Y.......O<br>WELI New Haven, Conn.. M |
| CJAT Trail, B.C..........O | XENT Nueve Laredo, Mex . X | 910 | | CKY Winnipeg, Man......U | ‡CBF Montreal, Que......W |
| †KOMO Seattle, Wash......O | †KPRC Houston, Texas.....O<br>^KFEL↓KVOD Denver.....M | 920 | | †WWJ Detroit, Mich........S<br>WAAF Chicago, Ill.........O<br>CMX Havana.....T | WORL Boston, Mass......M<br>WPEN Philadelphia, Pa....O |
| CFAC Calgary, Alta.........O<br>KROW Oakland, Cal.......O | ↓KMA Shenandoah, Ia...... O | 930 | | †WBRC Birmingham, Ala....O | CHNS Halifax, N S........M<br>*WDBJ Roanoke, Va.........O |
| *KOIN Portland, Ore.......O | ‡WDAY Fargo, N. D........O<br>WHA Madison, Wis........S | 940 | | ‡WAVE Louisville, Ky......O<br>XEFO Mexico City, Mex...S | †WCSH Portland, Maine....O<br>WAAT Jersey City, N. J... M |
| KFWB Hollywood, Cal.....O | *KMBC Kansas City, Mo...O | 950 | | WHAL Saginaw, Mich.... M<br>CMBC Havana, Cuba......P | CBV Quebec Que..........O<br>†WRC Washington, D.C.... O |
| | XEAW Reynosa, Tams.... X | 960 | | CRCY Toronto, Ont. ......H | CHNC New Carlisle, Que..O |
| ↓KJR Seattle, Wash.........S | | 970 | | ‡WCFL Chicago, Ill.........S | WIBG Glenside, Pa........H |
| | | 980 | | | ↓KDKA Pittsburgh, Pa...W |
| | XEAF Nogales, Mexico.... N | 990 | | | ↓WBZ-WBZA Boston... W |
| KFVD Los Angeles, Cal...O | †WHO Des Moines, Iowa. W | 1000 | | | |
| CKCK Regina, Sask.........O<br>^KQW San Jose, Cal.........O | ^KGGF Coffeyville, Kas.... O<br>WNAD Norman, Okla..... O | 1010 | | *WNOX Knoxville, Tenn....O | WHN New York City......O |
| | XEJ Juarez, Mex...........O | 1020 | | WDZ Tuscola, Ill...........K | †KYW Philadelphia, Pa....T |
| CFCN Calgary, Alta.. .....T | XEB Mexico City, Mex ....T | 1030 | | ^CKLW Windsor-Detroit....S | CMCK Havana, Cuba......S |
| KWJJ Portland, Ore.......M<br>KYOS Merced, Cal.........K | *KRLD Dallas, Tex.......T | 1040 | | | †WTIC Hartford, Conn... W |
| *KNX Los Angeles, Cal ..W | WEAU Eau Claire, Wis.....O<br>KFBI Abilene, Kas.......S | 1050 | | WIBC Indianapolis, Ind....O | †CBM Montreal, Que.......S |

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# *Silvertone*

## RADIO TIME TABLE AND LOG

*of*

## American
## Broadcast and Short Wave

*and*

## Foreign Short Wave
## Stations

SEARS ROEBUCK & COMPANY

| 100 | 250 | 300 | 500 | 750 | 1000 | 1500 | 2000 | 2500 | 5000 | WATTS POWER CODE | 10000 | 15000 | 25000 | 50000 | 100,000 | 250,000 | 500,000 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| H | K | L | M | N | O | P | Q | R | S | | T | U | V | W | X | Y | Z |

Revision 59

*Columbia; †NBC Red; ⸸NBC Blue; ‡NBC Red & Blue; ▲Mutual

| WESTERN<br>*Wash., Ore., Cal., Utah, Etc.* | MIDDLE WESTERN<br>*Minn., Ia., Neb., Mo., Tex., Etc* | KILO. | Dial No. | CENTRAL<br>*Ill., Mich., Ohio, Tenn., Etc.* | EASTERN<br>*Mass., N. Y., Pa., N. C., Etc.* |
|---|---|---|---|---|---|
| **CJRM** Moose Jaw, Sask....O | | 540 | | | **CFNB** Fredericton, N.B. M |
| **KOAC** Corvallis, Ore.......O<br>‡**KFYR** Bismarck, N. D.....O | †**KSD-KFUO** St. Louis, Mo. O<br>***KTSA** San Antonio, Tex...O | 550 | | ***WKRC** Cincinnati, Ohio....O<br>**WSVA** Staunton, Va.......M | ***WGR** Buffalo, N. Y........O<br>**WDEV** Waterbury Vt......M |
| ***KLZ** Denver, Colo.........O<br>***KSFO** San Francisco, Cal..O | **KWTO** Springfield, Mo.... O<br>‡**KFDM** Beaumont, Tex.....O | 560 | | **WIND** Chicago-Gary.......O<br>‡**WIS** Columbia, S.C.......O | ⸸▲**WFIL** Philadelphia, Pa... O<br>***WQAM** Miami, Fla.........O |
| ***KVI** Tacoma, Wash........O<br>**KMTR** Los Angeles, Cal...O | ***WNAX** Yankton, S. D.....O<br>‡**KGKO** Ft. Worth, Tex.....O | 570 | | ***WKBN** Youngstown, Ohio. M<br>**WOSU** Columbus, Ohio.....O | ‡**WWNC** Asheville, N. C......O<br>**WMCA** New York (⸸**WSYR**) Q |
| **CKUA** Edmonton, Alta.....M<br>‡**KMJ** Fresno, Cal..........O | ***WIBW** Topeka, Kas........O<br>**KSAC** Manhattan, Kas.....M | 580 | | **WILL** Urbana, Ill..........O<br>***WCHS** Charleston, W. Va..M | †**WTAG** Worcester, Mass....O<br>***WDBO** Orlando, Fla.......O |
| †**KHQ** Spokane, Wash.......O | †**WOW** Omaha, Neb........S | 590 | | **WKZO** Kalamazoo, Mich...K | ***WEEI** Boston, Mass........O |
| **CJOR** Vancouver, B C......M<br>⸸**KFSD** San Diego, Cal......M | ⸸▲**WMT** Cedar Rapids, Ia...O<br>***WREC** Memphis, Tenn.....O | 600 | | ⸸**CFCF** Montreal, Que......M<br>**CBW** Windsor, Ont........M<br>**CMQ** Havana, Cuba..V | ⸸▲**WICC** Bridgeport, Conn . M<br>***WCAO** Baltimore, Md.... M |
| **KFAR** Fairbanks, Alaska...O<br>***KFRC** San Francisco, Cal...O | †**WDAF** Kansas City, Mo....O | 610 | | ▲**WCLE** Cleveland, Ohio.....M | **WIP** Philadelphia, Pa..... O<br>‡**WIOD** Miami, Fla.........O |
| †**KGW** Portland, Ore.........O<br>‡**KTAR** Phoenix, Ariz.......O | **KWFT** Wichita Falls, Tex...K | 620 | | ‡**WTMJ** Milwaukee, Wis....O<br>‡**WFLA**-‡**WSUN** Florida...O | *▲**WLBZ** Bangor, Maine....O<br>**WHJB** Greensburg, Pa .....K |
| **CJRC** Winnipeg, Man..... O<br>**KGFX** Pierre, S.D.........J | **KFRU** Columbia, Mo......M | 630 | | ‡**WGBF** Evansville, Ind.....M<br>⸸**WMAL** Washington, D. C. K | **CFCY** Charlottetown, PEI..O<br>***WPRO** Providence, R. I.... M |
| †**KFI** Los Angeles, Cal ....W | **WOI** Ames, Iowa..........S | 640 | | ▲**WHKC** Columbus, Ohio...M | ***WGAN** Portland, Me..... M |
| | | 650 | | ‡▲**WSM** Nashville, Tenn...W | |
| | **WAAW** Omaha, Nebr......M | 660 | | **XEAL** Mexico City, Mex...O | †**WEAF** New York City...W |
| | | 670 | | †**WMAQ** Chicago, Ill..... W | |
| †**KPO** San Francisco, Cal..W | **KFEQ** St. Joseph, Mo......R | 680 | | **CMBQ** Havana, Cuba......S | **WLAW** Lawrence, Mass..O<br>‡**WPTF** Raleigh, N. C.......O |
| **CJCJ** Calgary, Alta.......M | **XET** Monterey, Mex.........S | 690 | | **NAA** Arlington, Va.........O | ***CFRB** Toronto, Ont.......S |
| | | 700 | | ▲‡**WLW** Cincinnati, Ohio..Z | |
| ***KIRO** Seattle, Wash...... O<br>**KMPC** Beverly Hills, Cal M | | 710 | | | ▲**WOR** Newark, N. J.......W |
| | | 720 | | ▲**WGN** Chicago, Ill. .....W | |
| **CJCA** Edmonton, Alta.....O | **XEPN** Pedras Negras, Mex. W | 730 | | **CMCL** Havana, ..(**CMK**) . T | ***CKAC** Montreal, Que....S |
| **KTRB** Modesto, Cal.......K | **KMMJ** Clay Center, Neb..O | 740 | | †**WSB** Atlanta, Ga.......W | **WHEB** Portsmouth, N. H..K |
| ‡**KGU** Honolulu, Hawaii....R | | 750 | | ***WJR** Detroit, Mich. ....W | **CMBL** Havana, Cuba......R |
| **KXA** Seattle, Wash........ O<br>**XEOK** Tia Juana, Mex .... K | **WLB** Minneapolis (**WCAL**) . S<br>**WEW** St. Louis, Mo........O | 760 | | | ⸸**WJZ** New York (**WBAL**) W |
| | ***KFAB** Lincoln, Nebr.....T | 770 | | ***WBBM** Chicago, Ill.....W | **CMBF** Havana, Cuba ......S |
| **KWLK** Longview, Wash... K<br>**KEHE** Los Angeles, Cal....O | ‡**KGHL** Billings, Mont......O<br>**KFDY** Brookings, S. D.....O | 780 | | **WPIC** Sharon, Pa......... K<br>†**WMC** Memphis, Tenn......O | ⸸▲**WEAN** Providence, R.I....O<br>‡**WTAR** Norfolk, Va........ O |
| ⸸**KGO** San Francisco, Cal..T | ‡**KOAM** Pittsburg, Kas.....Q | 790 | | | †**WGY** Schenectady, N. Y. W |
| | ‡**WFAA** Dallas, (‡**WBAP**) . W | 800 | | **HIX** Santo Domingo, RD...O | **WTBO** Cumberland, Md...K |
| | ***WCCO** Minneapolis, Min W | 810 | | | **WNYC** New York City.... O |
| **XEBG** Tia Juana, Mex....O | | 820 | | ***WHAS** Louisville, Ky... W | |
| | ⸸**KOA** Denver, Colo.......W | 830 | | **WRUF** Gainesville, Fla.....S | **WHDH** Boston, Mass......O<br>**WEEU** Reading, Pa........O |
| **CFQC** Saskatoon, Sask..... O | **XERA** Villa Acuna, Mex. ...Z | 840 | | | ‡**CBL-CBT** Toronto, Ont. W |
| **KIEV** Glendale, Cal.......K | ***WWL** New Orleans, La... W | 850 | | **WKAR** E. Lansing, Mich...O | ***WESG** Elmira, N,Y........O |
| **XEMO** Tiajuana, Mex..... S | ▲**WHB** Kansas City, Mo.....O | 860 | | | ***WABC** New York......W |
| | | 870 | | ⸸**WENR-WLS** Chicago.. W | |
| **KLX** Oakland, Cal. ..... O | **WSUI** Iowa City, Ia. ...M<br>**KPOF** Denver..(***KFKA**) O | 880 | | **CBO** Ottawa, Ont.........O<br>***WCOC** Meridian, Miss.....O | ***WGBI-WQAN** Scranton, Pa O<br>**WRNL** Richmond, Va. M |
| ***KFPY** Spokane, Wash....O<br>‡**KARK** Little Rock, Ark.... M | **KFNF** Shenandoah (**KUSD**) O<br>**XEW** Mexico City....... W | 890 | | **WSAA** Lafayette, Ind.....M<br>***WMMN** Fairmont, W. Va.. O | †**WJAR** Providence, R. I....M<br>***WGST** Atlanta, Ga........O |
| **KGBU** Ketchikan, Alaska O<br>‡**KSEI** Pocatello, Idaho.....K<br>***KHJ** Los Angeles, Cal. ..O | **WTAD** Quincy, Ill.........O<br>‡**WKY** Okla. City, Okla.....O | 900 | | **WLBL** Stevens Pt., Wis...S<br>‡**WJAX** Jacksonville, Fla....O | †**WBEN** Buffalo, N. Y.......O<br>**WELI** New Haven, Conn..M |
| **CJAT** Trail, B.C...........O | **XENT** Nueve Laredo, Mex . X | 910 | | **CKY** Winnipeg, Man......U | ‡**CBF** Montreal, Que......W |
| †**KOMO** Seattle, Wash......O | †**KPRC** Houston, Texas.....O<br>▲**KFEL**⸸**KVOD** Denver.....M | 920 | | †**WWJ** Detroit, Mich.......S<br>**WAAF** Chicago, Ill........O<br>**CMX** Havana.....T | **WORL** Boston, Mass......M<br>**WPEN** Philadelphia, Pa....O |
| **CFAC** Calgary, Alta........O<br>**KROW** Oakland, Cal.......O | ‡**KMA** Shenandoah, Ia...... O | 930 | | †**WBRC** Birmingham, Ala....O | **CHNS** Halifax, N.S........M<br>***WDBJ** Roanoke, Va........O |
| ***KOIN** Portland, Ore........O | ‡**WDAY** Fargo, N. D........O<br>**WHA** Madison, Wis........S | 940 | | ‡**WAVE** Louisville, Ky......O<br>**XEFO** Mexico City, Mex...S | †**WCSH** Portland, Maine....O<br>**WAAT** Jersey City, N. J...M |
| **KFWB** Hollywood, Cal.....O | ***KMBC** Kansas City, Mo...O | 950 | | **WHAL** Saginaw, Mich. ... M<br>**CMBC** Havana, Cuba......P | **CBV** Quebec Que..........O<br>†**WRC** Washington, D.C.... O |
| | **XEAW** Reynosa, Tams.... X | 960 | | **CRCY** Toronto, Ont. ......H | **CHNC** New Carlisle, Que..O |
| ⸸**KJR** Seattle, Wash........S | | 970 | | ‡**WCFL** Chicago, Ill.........S | **WIBG** Glenside, Pa....... H |
| | | 980 | | | ⸸**KDKA** Pittsburgh, Pa...W |
| | **XEAF** Nogales, Mexico.... N | 990 | | | ⸸**WBZ-WBZA** Boston... W |
| **KFVD** Los Angeles, Cal...O | †**WHO** Des Moines, Iowa. W | 1000 | | | |
| **CKCK** Regina, Sask........O<br>▲**KQW** San Jose, Cal....... O | ▲**KGGF** Coffeyville, Kas.... O<br>**WNAD** Norman, Okla..... O | 1010 | | ***WNOX** Knoxville, Tenn....O | **WHN** New York City......O |
| | **XEJ** Juarez, Mex..........O | 1020 | | **WDZ** Tuscola, Ill..........K | †**KYW** Philadelphia, Pa....T |
| **CFCN** Calgary, Alta.. ....T | **XEB** Mexico City, Mex... Y | 1030 | | ▲**CKLW** Windsor-Detroit....S | **CMCK** Havana, Cuba......S |
| **KWJJ** Portland, Ore.......M<br>**KYOS** Merced, Cal........K | ***KRLD** Dallas, Tex.......T | 1040 | | | †**WTIC** Hartford, Conn...W |
| ***KNX** Los Angeles, Cal ..W | **WEAU** Eau Claire, Wis....O<br>**KFBI** Abilene, Kas........S | 1050 | | **WIBC** Indianapolis, Ind....O | †**CBM** Montreal, Que......S |

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# *Silvertone*

## RADIO TIME TABLE AND LOG

*of*

American
Broadcast and Short Wave

*and*

Foreign Short Wave
Stations

SEARS ROEBUCK & COMPANY

| 100 | 250 | 300 | 500 | 750 | 1000 | 1500 | 2000 | 2500 | 5000 | WATTS POWER | 10000 | 15000 | 25000 | 50000 | 100,000 | 250,000 | 500,000 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| H | K | L | M | N | O | P | Q | R | S | CODE | T | U | V | W | X | Y | Z |

Revision 59 *Columbia; †NBC Red; ⸸NBC Blue; ‡NBC Red & Blue; ▲Mutual

| WESTERN<br>*Wash., Ore., Cal., Utah, Etc.* | MIDDLE WESTERN<br>*Minn., Ia., Neb., Mo., Tex., Etc* | KILO. | Dial No. | CENTRAL<br>*Ill., Mich., Ohio, Tenn., Etc.* | EASTERN<br>*Mass., N. Y., Pa., N. C., Etc.* |
|---|---|---|---|---|---|
| CJRM Moose Jaw, Sask....O | | 540 | | | CFNB Fredericton, N.B. M |
| KOAC Corvallis, Ore.......O<br>‡KFYR Bismarck, N. D.....O | †KSO-KFUO St. Louis, Mo. O<br>*KTSA San Antonio, Tex...O | 550 | | *WKRC Cincinnati, Ohio....O<br>WSVA Staunton, Va.......M | *WGR Buffalo, N. Y........O<br>WDEV Waterbury Vt......M |
| *KLZ Denver, Colo.........O<br>*KSFO San Francisco, Cal..O | KWTO Springfield, Mo....O<br>‡KFDM Beaumont, Tex.....O | 560 | | WIND Chicago-Gary.......O<br>‡WIS Columbia, S.C.........O | ⸸▲WFIL Philadelphia, Pa...O<br>*WQAM Miami, Fla.........O |
| *KVI Tacoma, Wash.........O<br>KMTR Los Angeles, Cal...O | *WNAX Yankton, S. D.....O<br>‡KGKO Ft. Worth Tex.....O | 570 | | *WKBN Youngstown, Ohio. M<br>WOSU Columbus, Ohio....O | ‡WWNC Asheville, N. C.....O<br>WMCA New York (⸸WSYR) O |
| CKUA Edmonton, Alta....M<br>‡KMJ Fresno, Cal..........O | *WIBW Topeka, Kas.......O<br>KSAC Manhattan, Kas....M | 580 | | WILL Urbana, Ill..........O<br>*WCHS Charleston, W. Va..M | †WTAG Worcester, Mass....O<br>*WDBO Orlando, Fla.......O |
| †KHQ Spokane, Wash......O | †WOW Omaha, Neb.........S | 590 | | WKZO Kalamazoo, Mich...K | *WEEI Boston, Mass........O |
| CJOR Vancouver, B C.....M<br>⸸KFSD San Diego, Cal.....M | ⸸▲WMT Cedar Rapids, Ia..O<br>*WREC Memphis, Tenn....O | 600 | | ⸸CFCF Montreal, Que......M<br>CBW Windsor, Ont.......M<br>CMQ Havana, Cuba..V | ⸸▲WICC Bridgeport, Conn. M<br>*WCAO Baltimore, Md.... M |
| KFAR Fairbanks, Alaska...O<br>▲KFRC San Francisco, Cal...O | †WDAF Kansas City, Mo....O | 610 | | ▲WCLE Cleveland, Ohio....M | WIP Philadelphia, Pa.....O<br>‡WIOD Miami, Fla.........O |
| †KGW Portland, Ore........O<br>‡KTAR Phoenix, Ariz.......O | KWFT Wichita Falls, Tex...K | 620 | | ‡WTMJ Milwaukee, Wis....O<br>‡WFLA-‡WSUN Florida...O | *▲WLBZ Bangor, Maine....O<br>WHJB Greensburg, Pa.....K |
| CJRC Winnipeg, Man..... [illegible]<br>KGFX Pierre, S.D.......J | KFRU Columbia, Mo......M | 630 | | ‡WGBF Evansville, Ind.....M<br>⸸WMAL Washington, D. C. K | CFCY Charlottetown, PEI..O<br>*WPRO Providence, R. I... M |
| †KFI Los Angeles, Cal ....W | WOI Ames, Iowa..........S | 640 | | ▲WHKC Columbus, Ohio...M | *WGAN Portland, Me..... M |
| | | 650 | | ‡▲WSM Nashville, Tenn...W | |
| | WAAW Omaha, Nebr......M | 660 | | XEAL Mexico City, Mex..O | †WEAF New York City...W |
| | | 670 | | †WMAQ Chicago, Ill.....W | |
| †KPO San Francisco, Cal..W | KFEQ St. Joseph, Mo......R | 680 | | CMBQ Havana, Cuba.....S | WLAW Lawrence, Mass..O<br>‡WPTF Raleigh, N. C.......O |
| CJCJ Calgary, Alta.......M | XET Monterey, Mex........S | 690 | | NAA Arlington, Va.........O | *CFRB Toronto, Ont.......S |
| | | 700 | | ▲‡WLW Cincinnati, Ohio..Z | |
| *KIRO Seattle, Wash...... O<br>KMPC Beverly Hills, Cal M | | 710 | | | ▲WOR Newark, N. J.......W |
| | | 720 | | ▲WGN Chicago, Ill. .....W | |
| CJCA Edmonton, Alta.....O | XEPN Pedras Negras, Mex. W | 730 | | CMCL Havana, ..(CMK) .T | *CKAC Montreal, Que....S |
| KTRB Modesto, Cal.......K | KMMJ Clay Center, Neb..O | 740 | | †WSB Atlanta, Ga.......W | WHEB Portsmouth, N. H..K |
| ‡KGU Honolulu, Hawaii....R | | 750 | | *WJR Detroit, Mich. ....W | CMBL Havana, Cuba......R |
| KXA Seattle, Wash........O<br>XEOK Tia Juana, Mex ... K | WLB Minneapolis (WCAL).S<br>WEW St. Louis, Mo........O | 760 | | | ⸸WJZ New York (WBAL) W |
| | *KFAB Lincoln, Nebr.....T | 770 | | *WBBM Chicago, Ill.....W | CMBF Havana, Cuba ......S |
| KWLK Longview, Wash...K<br>KEHE Los Angeles, Cal. ..O | ‡KGHL Billings, Mont......O<br>KFDY Brookings, S. D.....O | 780 | | WPIC Sharon, Pa.........K<br>†WMC Memphis, Tenn......O | ⸸▲WEAN Providence, R.I....O<br>‡WTAR Norfolk, Va.......O |
| ⸸KGO San Francisco, Cal..T | ‡KOAM Pittsburg, Kas.....Q | 790 | | | †WGY Schenectady, N. Y. W |
| | ‡WFAA Dallas, (‡WBAP).W | 800 | | HIX Santo Domingo, RD...O | WTBO Cumberland, Md...K |
| | *WCCO Minneapolis, Min W | 810 | | | WNYC New York City.... O |
| XEBG Tia Juana, Mex....O | | 820 | | *WHAS Louisville, Ky... W | |
| | ⸸KOA Denver, Colo.......W | 830 | | WRUF Gainesville, Fla.....S | WHDH Boston, Mass......O<br>WEEU Reading, Pa........O |
| CFQC Saskatoon, Sask..... O | XERA Villa Acuna, Mex. ...Z | 840 | | | ‡CBL-CBT Toronto, Ont. W |
| KIEV Glendale, Cal.......K | *WWL New Orleans, La...W | 850 | | WKAR E. Lansing, Mich...O | *WESG Elmira, N.Y........O |
| XEMO Tiajuana, Mex..... S | ▲WHB Kansas City, Mo....O | 860 | | | *WABC New York......W |
| | | 870 | | ⸸WENR-WLS Chicago.. W | |
| KLX Oakland, Cal. O | WSUI Iowa City, Ia. ......M<br>KPOF Denver..(*KFKA) O | 880 | | CBO Ottawa, Ont.........O<br>*WCOC Meridian, Miss.....O | *WGBI-WQAN Scranton, Pa O<br>WRNL Richmond, Va. M |
| *KFPY Spokane, Wash ..O<br>‡KARK Little Rock, Ark.. M | KFNF Shenandoah (KUSD) O<br>XEW Mexico City....... W | 890 | | WBAA Lafayette, Ind.....M<br>*WMMN Fairmont, W. Va.. O | †WJAR Providence, R. I.... M<br>*WGST Atlanta, Ga........ O |
| KGBU Ketchikan, Alaska O<br>‡KSEI Pocatello, Idaho.....K<br>*KHJ Los Angeles, Cal....O | WTAD Quincy, Ill..........O<br>‡WKY Okla. City, Okla.....O | 900 | | WLBL Stevens Pt., Wis....S<br>‡WJAX Jacksonville, Fla....O | †WBEN Buffalo, N. Y.......O<br>WELI New Haven, Conn..M |
| CJAT Trail, B.C..........O | XENT Nueve Laredo, Mex . X | 910 | | CKY Winnipeg, Man......U | ‡CBF Montreal, Que......W |
| †KOMO Seattle, Wash......O | †KPRC Houston, Texas.....O<br>▲KFEL⸸KVOD Denver.....M | 920 | | †WWJ Detroit, Mich........S<br>WAAF Chicago, Ill.........O<br>CMX Havana.....T | WORL Boston, Mass......M<br>WPEN Philadelphia, Pa....O |
| CFAC Calgary, Alta........O<br>KROW Oakland, Cal.......O | ⸸KMA Shenandoah, Ia...... O | 930 | | †WBRC Birmingham, Ala....O | CHNS Halifax, N.S........M<br>*WDBJ Roanoke, Va........O |
| *KOIN Portland, Ore.......O | ‡WDAY Fargo, N. D........O<br>WHA Madison, Wis........S | 940 | | ‡WAVE Louisville, Ky......O<br>XEFO Mexico City, Mex...S | †WCSH Portland, Maine....O<br>WAAT Jersey City, N. J...M |
| KFWB Hollywood, Cal.....O | *KMBC Kansas City, Mo...O | 950 | | WHAL Saginaw, Mich.... M<br>CMBC Havana, Cuba......P | CBV Quebec Que..........O<br>†WRC Washington, D.C.... O |
| | XEAW Reynosa, Tams.... X | 960 | | CRCY Toronto, Ont. ......H | CHNC New Carlisle, Que..O |
| ⸸KJR Seattle, Wash.........S | | 970 | | ‡WCFL Chicago, Ill.........S | WIBG Glenside, Pa....... H |
| | | 980 | | | ⸸KDKA Pittsburgh, Pa...W |
| | XEAF Nogales, Mexico.... N | 990 | | | ⸸WBZ-WBZA Boston... W |
| KFVD Los Angeles, Cal...O | †WHO Des Moines, Iowa. W | 1000 | | | |
| CKCK Regina, Sask.........O<br>▲KQW San Jose, Cal.........O | ▲KGGF Coffeyville, Kas....O<br>WNAD Norman, Okla......O | 1010 | | *WNOX Knoxville, Tenn....O | WHN New York City......O |
| | XEJ Juarez, Mex..........O | 1020 | | WDZ Tuscola, Ill..........K | †KYW Philadelphia, Pa....T |
| CFCN Calgary, Alta.. ....T | XEB Mexico City, Mex ....T | 1030 | | ▲CKLW Windsor-Detroit....S | CMCK Havana, Cuba......S |
| KWJJ Portland, Ore.......M<br>KYOS Merced, Cal.........K | *KRLD Dallas, Tex.......T | 1040 | | | †WTIC Hartford, Conn...W |
| *KNX Los Angeles, Cal ..W | WEAU Eau Claire, Wis.....O<br>KFBI Abilene, Kas.......S | 1050 | | WIBC Indianapolis, Ind...O | †CBM Montreal, Que.......S |

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# *Silvertone*

## RADIO TIME TABLE AND LOG

*of*

## American
## Broadcast and Short Wave

*and*

## Foreign Short Wave
## Stations

**SEARS ROEBUCK & COMPANY**

| 100 | 250 | 300 | 500 | 750 | 1000 | 1500 | 2000 | 2500 | 5000 | WATTS POWER | 10000 | 15000 | 25000 | 50000 | 100,000 | 250,000 | 500,000 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| H | K | L | M | N | O | P | Q | R | S | CODE | T | U | V | W | X | Y | Z |

Revision 59

*Columbia; †NBC Red; ⸸NBC Blue; ‡NBC Red & Blue; ▲Mutual

| WESTERN<br>*Wash., Ore., Cal., Utah, Etc.* | MIDDLE WESTERN<br>*Minn., Ia., Neb., Mo., Tex., Etc* | KILO. | Dial No. | CENTRAL<br>*Ill., Mich., Ohio, Tenn., Etc.* | EASTERN<br>*Mass., N. Y., Pa., N. C., Etc.* |
|---|---|---|---|---|---|
| CJRM Moose Jaw, Sask....O | | 540 | | | CFNB Fredericton, N.B. M |
| K[illegible]AC [illegible], Ore.......O<br>‡KFYR Bismarck, N. D.....O | †KSD-KFUO St. Louis, Mo. O<br>*KTSA San Antonio, Tex. .O | 550 | | *WKRC Cincinnati, Ohio....O<br>WSVA Staunton, Va.,....M | *WGR Buffalo, N. Y........O<br>WDEV Waterbury Vt,....M |
| *KLZ Denver, Colo.........O<br>*KSFO San Francisco, Cal..O | KWTO Springfield, Mo....O<br>‡KFDM Beaumont, Tex.....O | 560 | | WIND Chicago-Gary.......O<br>‡WIS Columbia, S C.........O | ⸸▲WFIL Philadelphia, Pa...O<br>*WQAM Miami, Fla.........O |
| *KVI Tacoma, Wash.........O<br>KMTR Los Angeles, Cal...O | *WNAX Yankton, S. D.....O<br>‡KGKO Ft. Worth Tex.....O | 570 | | *WKBN Youngstown, Ohio. M<br>WOSU Columbus, Ohio....O | ‡WWNC Asheville, N. C.....O<br>WMCA New York (⸸WSYR) Q |
| CKUA Edmonton, Alta....M<br>‡KMJ Fresno, Cal..........O | *WIBW Topeka, Kas........O<br>KSAC Manhattan, Kas....M | 580 | | WILL Urbana, Ill..........O<br>*WCHS Charleston, W. Va. .M | †WTAG Worcester, Mass....O<br>*WDBO Orlando, Fla.......O |
| †KHQ Spokane, Wash......O | †WOW Omaha, Neb........S | 590 | | WKZO Kalamazoo, Mich...K | *WEEI Boston, Mass........O |
| CJOR Vancouver, B C.....M<br>⸸KFSD San Diego, Cal. ...M | ⸸▲WMT Cedar Rapids, Ia..O<br>*WREC Memphis, Tenn ...O | 600 | | ⸸CFCF Montreal, Que......M<br>CBW Windsor, Ont.........M<br>CMQ Havana, Cuba. V | ⸸▲WICC Bridgeport, Conn . M<br>*WCAO Baltimore, Md.... M |
| KFAR Fairbanks, Alaska...O<br>*KFRC San Francisco, Cal. .O | †WDAF Kansas City, Mo....O | 610 | | ▲WCLE Cleveland, Ohio....M | WIP Philadelphia, Pa..... O<br>‡WIOD Miami, Fla.........O |
| †KGW Portland, Ore........O<br>‡KTAR Phoenix, Ariz. ....O | KWFT Wichita Falls, Tex...K | 620 | | ‡WTMJ Milwaukee, Wis....O<br>‡WFLA-‡WSUN Florida...O | *▲WLBZ Bangor, Maine....O<br>WHJB Greensburg, Pa ....K |
| CJRC Winnipeg, Man.....O<br>KGFX Pierre, S.D. . [illegible] | KFRU Columbia, Mo......M | 630 | | ‡WGBF Evansville, Ind.....M<br>⸸WMAL Washington, D. C. K | CFCY Charlottetown, PEI..O<br>*WPRO Providence, R. I.... M |
| †KFI Los Angeles, Cal ...W | WOI Ames, Iowa..........S | 640 | | ▲WHKC Columbus, Ohio...M | *WGAN Portland, Me..... M |
| | | 650 | | ‡▲WSM Nashville, Tenn...W | |
| | WAAW Omaha, Nebr......M | 660 | | XEAL Mexico City, Mex...O | †WEAF New York City...W |
| | | 670 | | †WMAQ Chicago, Ill..... W | |
| †KPO San Francisco, Cal..W | KFEQ St. Joseph, Mo......R | 680 | | CMBQ Havana, Cuba.....S | WLAW Lawrence, Mass..O<br>‡WPTF Raleigh, N. C.,.....O |
| CJCJ Calgary, Alta.......M | XET Monterey, Mex........S | 690 | | NAA Arlington, Va.........O | *CFRB Toronto, Ont.......S |
| | | 700 | | ▲‡WLW Cincinnati, Ohio..Z | |
| *KIRO Seattle, Wash......O<br>KMPC Beverly Hills, Cal M | | 710 | | | ▲WOR Newark, N. J......W |
| | | 720 | | ▲WGN Chicago, Ill. .....W | |
| CJCA Edmonton, Alta.....O | XEPN Pedras Negras, Mex. W | 730 | | CMCL Havana, ..(CMK) T | *CKAC Montreal, Que....S |
| KTRB Modesto, Cal.......K | KMMJ Clay Center, Neb..O | 740 | | †WSB Atlanta, Ga.......W | WHEB Portsmouth, N. H..K |
| ‡KGU Honolulu, Hawaii....R | | 750 | | *WJR Detroit, Mich. ....W | CMBL Havana, Cuba......R |
| KXA Seattle, Wash........O<br>XEDK Tia Juana, Mex ....K | WLB Minneapolis (WCAL), .S<br>WEW St. Louis, Mo ......O | 760 | | | ⸸WJZ New York (WBAL) W |
| | *KFAB Lincoln, Nebr.....T | 770 | | *WBBM Chicago, Ill.....W | CMBF Havana, Cuba ......S |
| KWLK Longview, Wash ..K<br>KEHE Los Angeles, Cal. O | ‡KGHL Billings, Mont......O<br>KFDY Brookings, S. D.....O | 780 | | WPIC Sharon, Pa.........K<br>†WMC Memphis, Tenn.....O | ⸸▲WEAN Providence, R.I....O<br>‡WTAR Norfolk, Va....... O |
| ⸸KGO San Francisco, Cal..T | ‡KOAM Pittsburg, Kas.....Q | 790 | | | †WGY Schenectady, N. Y. W |
| | ‡WFAA Dallas, (‡WBAP). W | 800 | | HIX Santo Domingo, RD...O | WTBO Cumberland, Md...K |
| | *WCCO Minneapolis, Min W | 810 | | | WNYC New York City.... O |
| XEBG Tia Juana, Mex....O | | 820 | | *WHAS Louisville, Ky... W | |
| | ⸸KOA Denver, Colo.......W | 830 | | WRUF Gainesville, Fla.....S | WHDH Boston, Mass......O<br>WEEU Reading, Pa........O |
| CFQC Saskatoon, Sask..... O | XERA Villa Acuna, Mex. ...Z | 840 | | | ‡CBL-CBT Toronto, Ont. W |
| KIEV Glendale, Cal.......K | *WWL New Orleans, La... W | 850 | | WKAR E. Lansing, Mich...O | *WESG Elmira, N,Y.......O |
| XEMO Tiajuana, Mex. . S | ▲WHB Kansas City, Mo.....O | 860 | | | *WABC New York......W |
| | | 870 | | ⸸WENR-WLS Chicago.. W | |
| KLX Oakland, Cal. O | WSUI Iowa City, Ia. M<br>KPOF Denver (*KFKA) O | 880 | | CBO Ottawa, Ont.........O<br>*WCOC Meridian, Miss....O | *WGBI-WQAN Scranton, Pa O<br>WRNL Richmond, Va. M |
| *KFPY Spokane, Wash ..O<br>‡KARK Little Rock, Ark....M | KFNF Shenandoah (KUSD) O<br>XEW Mexico City........ W | 890 | | WBAA Lafayette, Ind.....M<br>*WMMN Fairmont, W. Va.. O | †WJAR Providence, R. I....M<br>*WGST Atlanta, Ga........ O |
| KGBU Ketchikan, Alaska O<br>‡KSEI Pocatello, Idaho....K<br>*KHJ Los Angeles, Cal....O | WTAD Quincy, Ill........O<br>‡WKY Okla. City, Okla.....O | 900 | | WLBL Stevens Pt., Wis...S<br>‡WJAX Jacksonville, Fla....O | †WBEN Buffalo, N. Y.......O<br>WELI New Haven, Conn..M |
| CJAT Trail, B.C..........O | XENT Nueve Laredo, Mex . X | 910 | | CKY Winnipeg, Man......U | ‡CBF Montreal, Que......W |
| †KOMO Seattle, Wash......O | †KPRC Houston, Texas.....O<br>▲KFEL⸸KVOD Denver.....M | 920 | | †WWJ Detroit, Mich.......S<br>WAAF Chicago, Ill........O<br>CMX Havana.....T | WORL Boston, Mass......M<br>WPEN Philadelphia, Pa....O |
| CFAC Calgary, Alta.......O<br>KROW Oakland, Cal.......O | ⸸KMA Shenandoah, Ia...... O | 930 | | †WBRC Birmingham, Ala....O | CHNS Halifax, N.S.......M<br>*WDBJ Roanoke, Va........O |
| *KOIN Portland, Ore.......O | ‡WDAY Fargo, N. D........O<br>WHA Madison, Wis........S | 940 | | ‡WAVE Louisville, Ky......O<br>XEFO Mexico City, Mex...S | †WCSH Portland, Maine....O<br>WAAT Jersey City, N. J...M |
| KFWB Hollywood, Cal.....O | *KMBC Kansas City, Mo...O | 950 | | WHAL Saginaw, Mich. ... M<br>CMBC Havana, Cuba......P | CBV Quebec Que..........O<br>†WRC Washington, D.C.... O |
| | XEAW Reynosa, Tams.... X | 960 | | CRCY Toronto, Ont. ......H | CHNC New Carlisle, Que..O |
| ⸸KJR Seattle, Wash........S | | 970 | | ‡WCFL Chicago, Ill.........S | WIBG Glenside, Pa.......H |
| | | 980 | | | ⸸KDKA Pittsburgh, Pa...W |
| | XEAF Nogales, Mexico....N | 990 | | | ⸸WBZ-WBZA Boston...W |
| KFVD Los Angeles, Cal...O | †WHO Des Moines, Iowa. W | 1000 | | | |
| CKCK Regina, Sask........O<br>▲KQW San Jose, Cal......O | ▲KGGF Coffeyville, Kas.... O<br>WNAD Norman, Okla..... O | 1010 | | *WNOX Knoxville, Tenn....O | WHN New York City......O |
| | XEJ Juarez, Mex..........O | 1020 | | WDZ Tuscola, Ill..........K | †KYW Philadelphia, Pa....T |
| CFCN Calgary, Alta.. ....T | XEB Mexico City, Mex....T | 1030 | | ▲CKLW Windsor-Detroit....S | CMCK Havana, Cuba.....S |
| KWJJ Portland, Ore.......M<br>KYOS Merced, Cal. .....K | *KRLD Dallas, Tex.......T | 1040 | | | †WTIC Hartford, Conn...W |
| *KNX Los Angeles, Cal ..W | WEAU Eau Claire, Wis.....O<br>KFBI Abilene, Kas........S | 1050 | | WIBC Indianapolis, Ind....O | †CBM Montreal, Que......S |

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# *Silvertone*

## RADIO TIME TABLE AND LOG

*of*

## American
## Broadcast and Short Wave

*and*

## Foreign Short Wave
## Stations

SEARS ROEBUCK & COMPANY

# *Silvertone*

## RADIO TIME TABLE AND LOG

*of*

## American
## Broadcast and Short Wave

*and*

## Foreign Short Wave
## Stations

SEARS ROEBUCK & COMPANY

| 100 | 250 | 300 | 500 | 750 | 1000 | 1500 | 2000 | 2500 | 5000 | WATTS POWER CODE | 10000 | 15000 | 25000 | 50000 | 100,000 | 250,000 | 500,000 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| H | K | L | M | N | O | P | Q | R | S | | T | U | V | W | X | Y | Z |

Revision 59 *Columbia; †NBC Red; ⸸NBC Blue; ‡NBC Red & Blue, ▲Mutual

| WESTERN<br>*Wash., Ore., Cal., Utah, Etc.* | MIDDLE WESTERN<br>*Minn., Ia., Neb., Mo., Tex., Etc* | KILO. | Dial No. | CENTRAL<br>*Ill., Mich., Ohio, Tenn., Etc.* | EASTERN<br>*Mass., N. Y., Pa., N. C., Etc.* |
|---|---|---|---|---|---|
| **CJRM** Moose Jaw, Sask....O | | 540 | | | **CFNB** Fredericton, N.B. M |
| **KOAC** Corvallis, Ore.......O<br>‡**KFYR** Bismarck, N. D.....O | †**KSD-KFUO** St. Louis, Mo. O<br>†**KTSA** San Antonio, Tex. O | 550 | | ***WKRC** Cincinnati, Ohio....O<br>**WSVA** Staunton, Va.......M | ***WGR** Buffalo, N. Y........O<br>**WDEV** Waterbury Vt.......M |
| ‡**KLZ** Denver, Colo..........O<br>***KSFO** San Francisco, Cal..O | **KWTO** Springfield, Mo.....O<br>‡**KFDM** Beaumont, Tex.....O | 560 | | **WIND** Chicago-Gary.......O<br>‡**WIS** Columbia, S C.........O | ⸸▲**WFIL** Philadelphia, Pa... O<br>***WQAM** Miami, Fla..........O |
| ***KVI** Tacoma, Wash.........O<br>**KMTR** Los Angeles, Cal...O | ***WNAX** Yankton, S. D.....O<br>‡**KGKO** Ft. Worth Tex.....O | 570 | | ***WKBN** Youngstown, Ohio. M<br>**WOSU** Columbus, Ohio....O | ‡**WWNC** Asheville, N. C.....O<br>**WMCA** New York (⸸**WSYR**) Q |
| **CKUA** Edmonton, Alta....M<br>‡**KMJ** Fresno, Cal..........O | ***WIBW** Topeka, Kas.......O<br>**KSAC** Manhattan, Kas ...M | 580 | | **WILL** Urbana, Ill..........O<br>***WCHS** Charleston, W. Va..M | †**WTAG** Worcester, Mass....O<br>***WDBO** Orlando, Fla........O |
| †**KHQ** Spokane, Wash......O | †**WOW** Omaha, Neb........S | 590 | | **WKZO** Kalamazoo, Mich...K | ***WEEI** Boston, Mass........O |
| **CJOR** Vancouver, B C.....M<br>⸸**KFSD** San Diego, Cal....M | ⸸▲**WMT** Cedar Rapids Ia..O<br>***WREC** Memphis, Tenn....O | 600 | | ⸸**CFCF** Montreal, Que......M<br>**CBW** Windsor Ont........M<br>**CMQ** Havana, Cuba..V | ⸸▲**WICC** Bridgeport, Conn . M<br>***WCAO** Baltimore, Md.... M |
| **KFAR** Fairbanks, Alaska...O<br>***KFRC** San Francisco, Cal...O | †**WDAF** Kansas City, Mo....O | 610 | | ▲**WCLE** Cleveland, Ohio....M | **WIP** Philadelphia, Pa.....O<br>‡**WIOD** Miami, Fla.........O |
| ‡**KGW** Portland, Ore.........O<br>⸸**KTAR** Phoenix, Ariz.......O | **KWFT** Wichita Falls, Tex...K | 620 | | ‡**WTMJ** Milwaukee, Wis....O<br>‡**WFLA**-‡**WSUN** Florida...O | *▲**WLBZ** Bangor, Maine....O<br>**WHJB** Greensburg, Pa ....K |
| **CJRC** Winnipeg, Man.....O<br>**KGFX** Pierre, S.D.........[illegible] | **KFRU** Columbia, Mo......M | 630 | | ‡**WGBF** Evansville, Ind.....M<br>⸸**WMAL** Washington, D. C. K | **CFCY** Charlottetown, PEI..O<br>***WPRO** Providence, R. I.... M |
| †**KFI** Los Angeles, Cal ...W | **WOI** Ames, Iowa..........S | 640 | | ▲**WHKC** Columbus, Ohio...M | ***WGAN** Portland, Me..... M |
| | | 650 | | ‡▲**WSM** Nashville, Tenn...W | |
| | **WAAW** Omaha, Nebr......M | 660 | | **XEAL** Mexico City, Mex..O | †**WEAF** New York City...W |
| | | 670 | | †**WMAQ** Chicago, Ill..... W | |
| †**KPO** San Francisco, Cal..W | **KFEQ** St. Joseph, Mo .....R | 680 | | **CMBQ** Havana, Cuba.....S | **WLAW** Lawrence, Mass..O<br>‡**WPTF** Raleigh, N. C.......O |
| **CJCJ** Calgary, Alta.......M | **XET** Monterey, Mex........S | 690 | | **NAA** Arlington, Va.........O | ***CFRB** Toronto, Ont.......S |
| | | 700 | | ▲‡**WLW** Cincinnati, Ohio..Z | |
| ***KIRO** Seattle, Wash.......O<br>**KMPC** Beverly Hills, Cal M | | 710 | | | ▲**WOR** Newark, N. J......W |
| | | 720 | | ▲**WGN** Chicago, Ill. .....W | |
| **CJCA** Edmonton, Alta ....O | **XEPN** Piedras Negras, Mex. W | 730 | | **CMCL** Havana...(**CMK**) .T | ***CKAC** Montreal, Que....S |
| **KTRB** Modesto, Cal..... .K | **KMMJ** Clay Center, Neb..O | 740 | | †**WSB** Atlanta, Ga.......W | **WHEB** Portsmouth, N. H..K |
| ‡**KGU** Honolulu, Hawaii....R | | 750 | | ***WJR** Detroit, Mich. ....W | **CMBL** Havana, Cuba......R |
| **KXA** Seattle, Wash........O<br>**XEOK** Tia Juana, Mex ... K | **WLB** Minneapolis (**WCAL**) .S<br>**WEW** St. Louis, Mo .......O | 760 | | | ⸸**WJZ** New York (**WBAL**) W |
| | ***KFAB** Lincoln, Nebr.....T | 770 | | ***WBBM** Chicago, Ill.....W | **CMBF** Havaua, Cuba ......S |
| **KWLK** Longview, Wash...K<br>**KEHE** Los Angeles Cal. O | ‡**KGHL** Billings, Mont......O<br>**KFDY** Brookings, S. D.....O | 780 | | **WPIC** Sharon, Pa.........K<br>†**WMC** Memphis, Tenn......O | ⸸▲**WEAN** Providence, R.I....O<br>‡**WTAR** Norfolk, Va.......O |
| ⸸**KGO** San Francisco, Cal..T | ‡**KOAM** Pittsburg, Kas.....O | 790 | | | †**WGY** Schenectady, N. Y. W |
| | ‡**WFAA** Dallas, (‡**WBAP**) . W | 800 | | **HIX** Santo Domingo, RD...O | **WTBO** Cumberland, Md...K |
| | ***WCCO** Minneapolis, Min W | 810 | | | **WNYC** New York City.... O |
| **XEBG** Tia Juana, Mex....O | | 820 | | ***WHAS** Louisville, Ky... W | |
| | ⸸**KOA** Denver, Colo.......W | 830 | | **WRUF** Gainesville, Fla.....S | **WHDH** Boston, Mass......O<br>**WEEU** Reading, Pa.........O |
| **CFQC** Saskatoon, Sask..... O | **XERA** Villa Acuna, Mex....Z | 840 | | | ‡**CBL-CBT** Toronto, Ont. W |
| **KIEV** Glendale, Cal.......K | ***WWL** New Orleans, La...W | 850 | | **WKAR** E. Lansing, Mich...O | ***WESG** Elmira, N,Y.......O |
| **XEMO** Tiajuana, Mex..... S | ▲**WHB** Kansas City, Mo.....O | 860 | | | ***WABC** New York......W |
| | | 870 | | ⸸**WENR-WLS** Chicago.. W | |
| **KLX** Oakland, Cal ...... O | ***WSUI** Iowa City, Ia. .M<br>**KPOF** Denver (▲**KFKA**) O | 880 | | **CBO** Ottawa, Ont.........O<br>***WCOC** Meridian, Miss.....O | ***WGBI-WQAN** Scranton, Pa O<br>**WRNL** Richmond, Va. M |
| ***KFPY** Spokane, Wash ...O<br>‡**KARK** Little Rock, Ark.... M | **KFNF** Shenandoah (**KUSD**) O<br>**XEW** Mexico City......... W | 890 | | **WBAA** Lafayette, Ind....M<br>***WMMN** Fairmont, W. Va.. O | †**WJAR** Providence, R. I....M<br>***WGST** Atlanta, Ga........O |
| **KGBU** Ketchikan, Alaska O<br>‡**KSEI** Pocatello, Idaho.....K<br>***KHJ** Los Angeles, Cal....O | **WTAD** Quincy, Ill.........O<br>‡**WKY** Okla. City, Okla.....O | 900 | | **WLBL** Stevens Pt., Wis...S<br>‡**WJAX** Jacksonville, Fla....O | †**WBEN** Buffalo, N. Y.......O<br>**WELI** New Haven, Conn..M |
| **CJAT** Trail, B.C...........O | **XENT** Nueve Laredo, Mex . X | 910 | | **CKY** Winnipeg, Man......U | ‡**CBF** Montreal, Que......W |
| †**KOMO** Seattle, Wash......O | †**KPRC** Houston, Texas.....O<br>▲**KFEL**⸸**KVOD** Denver.....M | 920 | | †**WWJ** Detroit, Mich........S<br>**WAAF** Chicago, Ill........O<br>**CMX** Havana.....T | **WORL** Boston, Mass......M<br>**WPEN** Philadelphia, Pa....O |
| **CFAC** Calgary, Alta........O<br>**KROW** Oakland, Cal........O | ⸸**KMA** Shenandoah, Ia...... O | 930 | | †**WBRC** Birmingham, Ala....O | **CHNS** Halifax, N.S........M<br>***WDBJ** Roanoke, Va........O |
| ***KOIN** Portland, Ore.......O | ‡**WDAY** Fargo, N. D........O<br>**WHA** Madison, Wis.........S | 940 | | ‡**WAVE** Louisville, Ky......O<br>**XEFO** Mexico City, Mex... S | †**WCSH** Portland, Maine....O<br>**WAAT** Jersey City, N. J...M |
| **KFWB** Hollywood, Cal.....O | ***KMBC** Kansas City, Mo...O | 950 | | **WHAL** Saginaw, Mich. ... M<br>**CMBC** Havana, Cuba......P | **CBV** Quebec Que...........O<br>†**WRC** Washington, D.C.... O |
| | **XEAW** Reynosa, Tams.... X | 960 | | **CRCY** Toronto, Ont. ......H | **CHNC** New Carlisle, Que..O |
| ⸸**KJR** Seattle, Wash.........S | | 970 | | ‡**WCFL** Chicago, Ill.........S | **WIBG** Glenside, Pa....... H |
| | | 980 | | | ⸸**KDKA** Pittsburgh, Pa...W |
| | **XEAF** Nogales, Mexico.... N | 990 | | | ⸸**WBZ-WBZA** Boston... W |
| **KFVD** Los Angeles, Cal...O | †**WHO** Des Moines, Iowa. W | 1000 | | | |
| **CKCK** Regina, Sask.........O<br>▲**KQW** San Jose, Cal....... O | ▲**KGGF** Coffeyville, Kas.... O<br>**WNAD** Norman, Okla..... O | 1010 | | ***WNOX** Knoxville, Tenn....O | **WHN** New York City......O |
| | **XEJ** Juarez, Mex...........O | 1020 | | **WDZ** Tuscola, Ill..........K | †**KYW** Philadelphia, Pa....T |
| **CFCN** Calgary, Alta.. ....T | **XEB** Mexico City, Mex.....Y | 1030 | | ▲**CKLW** Windsor-Detroit....S | **CMCK** Havana, Cuba......S |
| **KWJJ** Portland, Ore.......M<br>**KYOS** Merced, Cal.........K | ***KRLD** Dallas, Tex.......T | 1040 | | | †**WTIC** Hartford, Conn...W |
| ***KNX** Los Angeles, Cal ..W | **WEAU** Eau Claire, Wis.....O<br>**KFBI** Abilene, Kas. ....S | 1050 | | **WIBC** Indianapolis, Ind....O | †**CBM** Montreal, Que......S |

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100 250 300 500 750 1000 1500 2000 2500 5000 WATTS POWER 10000 15000 25000 50000 100,000 250,000 500,000
H K L M N O P Q R S CODE T U V W X Y Z

| | | | | | |
|---|---|---|---|---|---|
| AG Norfolk, Nebr......O | ‡**KTHS** Hot Springs, Ark..T | 1060 | | | ↓▲**WBAL** Baltimore, Md...T |
| BS San Francisco, Cal.. M | **WCAZ** Carthage, Ill. ........H | 1070 | | †**WTAM** Cleveland, Ohio. W | |
| | | 1080 | | **WMBI-WCBD** Chicago, Ill.. S | ***WBT** Charlotte, N. C....W |
| | ***KMOX** St. Louis, Mo... W | 1090 | | | |
| R Vancouver, B. C......S<br>DM Stockton, Cal.......O | ***KWKH** Shreveport, La. ...Y | 1100 | | | **WBIL** New York City......S<br>***WPG** Atlantic City, N. J....S |
| | **KSOO** Sioux Falls, S. D....S | 1110 | | **XELO** Piedras Negras, Mex. W | *▲**WRVA** Richmond, Va.. W |
| IO Spok'e, Wash. (**KRSC**)H<br>SG-KRKD Los Angeles M | **CKX** Brandon, Man........O<br>**WTAW** College Station, Tex M<br>**KTBC** Austin, Tex...O | 1120 | | ***WISN** Milwaukee, Wis......K<br>↓**WJBO** Baton Rouge, La...M | **WCOP** Boston, Mass.......M<br>†**WDEL** Wilmington, Del....K |
| SL Salt Lake City, Utah. W | | 1130 | | **WJJD** Chicago, Ill.........U | **WOV** New York City......O |
| | ‡**KVOO** Tulsa, Okla......V | 1140 | | ***WAPI** Birmingham, Ala. ...S | ▲**WSPR** Springfield, Mass...M |
| | **XEH** Monterey, Mex.......K | 1150 | | | ↓**WHAM** Rochester, N.Y. W |
| | **XED** Guadalajara, Mex....M | 1160 | | ↓**WOWO** Ft. Wayne, Ind....T | ***WWVA** Wheeling, W. Va....S |
| | | 1170 | | | ***WCAU** Philadelphia, Pa. W |
| X Portland, Ore.........S<br>B Albuquerque, N. M...T | ▲**WDGY** Minneapolis, Minn.. O | 1180 | | ***WMAZ** Macon, Ga........ O | **WINS** New York City...... O |
| KC Viscalia, Cal.......K | ‡**WOAI** San Antonio, Tex. W | 1190 | | **WSAZ** Huntington, W. Va. O | |
| UN-KGFJ-KVCV▲KVEC<br>G-KFXD-KDNC▲KOOS<br>OS‡KELO-KGVL-KFXJ<br>CI-KVNU-KAST | KBTM-KGHI-KGEK<br>KFJB-KMLB-WBNO-WJBW<br>KWNO-KGDE-WIL<br>▲KADA-WBBZ-WCAT-WDSM | 1200 | | WJHL<br>WBHP-WJRD-WJBC-WJBL<br>WWAE-WFAM-WMPC-WHBC<br>WCPO-WHBY-WCLO WTOL | ▲WTHT*WJNO-WRBL-WAYX<br>WABI*WIBX-WMFR-WOLS<br>WFTC-WEST-WKBO-WSAL<br>*WAIM WCAX WLVA WENY |
| LU<br>ON-KPPC*KROY▲KFXM<br>FA-KLAH-KFJI▲KGY<br>BG▲KASA-KWTN-KWJB | KFPW-WHBF*KGLO-KIUL<br>KANS*WMFG-WGRM-WGCM<br>KFVS▲KFOR-KDLR▲KVSO<br>KALB-WJMC-KOCA-WIBU | 1210 | | WJBY-WCRW-WEDC-WSBC<br>WEBQ-WTAX-WHBU↓WJIM<br>WJW‡WCOL-WBLY-WALR<br>WSIX-WCOV-WOMT-WRAL | WFOY-WPAX-WJEJ-WBRB<br>WSNJ-WGNY-WGBB↓WJTN<br>WSAY-WFAS‡WSOC-WKOK<br>▲WBAX WBBL▲WHAI-WOCB |
| W Seattle...(**KWSC**)...O | ↓**WREN-KFKU** Kansas City O | 1220 | | ***WDAE** Tampa, Fla........O | †▲**WCAE** Pittsburgh (**WCAD**) O |
| DC Lethbridge, Alta......H<br>A San Francisco, Cal....O | ‡**KGBX** Springfield, Mo.....M<br>**KGGM** Albuquerque, N.M. O | 1230 | | ***WFBM** Indianapolis, Ind...O | †**WNAC** Boston, Mass.......O<br>▲**WOL** Washington, D.C.....O |
| GU Manden No. Dakota K<br>FI Twin Falls, Idaho...M | ▲**KTAT** Ft. Worth, Tex.....O | 1240 | | ↓**WXYZ** Detroit, Mich.......O<br>**XEKL** Leon, Mex..........M | **CJCB** Sydney, N.S..........O<br>**WKAQ** San Juan, P. R.....O |
| T Yakima, Wash........M<br>OX Long Beach, Cal....O | ↓**WTCN** Minneapolis, Minn...O<br>**KXOK** St. Louis, Mo.......O | 1250 | | **WEST** New Castle, Pa......K<br>↓**WDSU** New Orleans, La....O | **WNEW** New York (**WHBI**) O<br>**WAIR** Winston-Salem, N.C.K |
| VO Missoula, Mont.....O<br>OA Tucson, Arizona. ...O | ↓▲**KOIL** Omaha, Nebr......O<br>**KPAC** Port Arthur (‡**KRGV**) O | 1260 | | ***WHIO** Dayton, O..........O<br>***WTOC** Savannah, Ga.......O | ***WNBX** Springfield, Vt.....M |
| SL Chico, Cal......K<br>L Seattle, Wash........O | **KWLC-KGCA** Decorah, Ia H<br>***KVOR** Colo. Springs, Colo..O | 1270 | | ↓**WOOD-WASH** Gr. Rpds..M<br>†**WJDX** Jackson, Miss.......O | †**WFBR** Baltimore, Md..... O |
| BB Great Falls, Mont....O<br>S Oakland, Cal.........K | ‡**WIBA** Madison, Wis....... O<br>▲**WRR** Dallas, Tex.........M | 1280 | | ***WDOD** Chattanooga, Tenn. O | ***WORC** Worcester, Mass... M<br>**WTNJ-WCAM-WCAP** NJ M |
| YL Salt Lake City.....O | ‡**WEBC** Duluth, Minn.......O<br>***KTRH** Houston, Tex.......O | 1290 | | ***WJAS** Pittsburgh, Pa......O | **WATR** Waterbury, Conn...K<br>**WNEL** San Juan, P. R.....M |
| LE Portland, Ore........ O<br>AC Los Angeles, Cal....O | **WHBL** Sheboygan, Wis.....M<br>***KFH** Wichita, Kas..........O | 1300 | | ‡**WFBC** Greenville S.C...... O | **WBBR-WFAB** New York..O<br>**WEVD-WHAZ** New York..O |
| RM-KCRJ-KSRO KHUB<br>EZ-KRQA-KSUB-KPDN<br>RO-KGFW-KBND | KCKN-KVOL-KRMD-KOME<br>KVOX-KROC-KRBA-KWOS<br>KWOC-KRRV-KOCY-KAND<br>KFPL‡KTSM-WDAH-KFYO | 1310 | | ↓WSGN-WGAU-WAML WGTN<br>WCLS-WTRC-WLBC‡WBOW<br>WCMI↓WFDF-WBEO-WEXL<br>WTJS‡WROL-WEMP-WGH | WLAK WTAL▲WNBH*WBRK<br>▲WLNH WMBO↓WEBR↓WMFF<br>*WSJS-WFBG-WSAJ-WJAC<br>WHAT-WTEL-WRAW‡WBRE |
| D Idaho Falls, Idaho....M<br>GMB Honolulu.........O | ***KRNT** Des Moines, Iowa....O<br>‡**KGHF** Pueblo, Colo.........M | 1320 | | ***WADC** Akron, Ohio........O<br>†**WSMB** New Orleans, La...O | ‡**WORK** York, Pa..........O |
| MO Tacoma, Wash......O<br>GB San Diego, Cal.......O | ***KSCJ** Sioux City, Ia.......O<br>‡**KRIS** Corpus Christi, Tex..M | 1330 | | ***WTAQ** Green Bay, Wis....O<br>‡▲**WSAI** Cincinnati, Ohio...O | ***WDRC** Hartford, Conn.....O |
| IR Butte, Mont..........M | **KDTH** Dubuque Iowa.....M<br>**KGNO** Dodge City, Kas....K | 1340 | | ↓**WSPD** Toledo, Ohio.......O<br>***WCOA** Pensacola, Fla......O | ‡▲**WFEA** Manchester N.H. M<br>**WFNC** Kinston, N.C.........K |
| DO Boise, Idaho.........O | ↓▲**KWK** St. Louis, Mo.......O | 1350 | | †**WMBG** Richmond, Va....M | **WBNX** New York (**WAWZ**) O |
| PM Minot, N. D.......M<br>ER Long Beach, Cal....O | ▲**KCRC** Enid, Okla.........K<br>**WQBC** Vicksburg, Miss....O | 1360 | | **WGES** Chicago, Ill........M<br>***WSBT** South Bend, Ind....M | ***WFBL** Syracuse, N. Y......O<br>‡**WCSC** Charleston, S. C....M |
| AR‡KERN-KRE-KICA<br>FL▲KSLM-KOBH<br>KO-KEEN-KUJ-KWYO<br>P-KOKO-KGKL-KRMC | KELD-KONO-KTEM-KFGQ<br>*WOC-KVGB-WMIN*WHLB<br>WFOR▲KTOK-KFJZ<br>KLUF-KFRO-KMAC-KVRS | 1370 | | WMFO-WAGF-WDWS*WEOA<br>‡WGL-WGRC-WHDF↓WIBM<br>WPAY-WHBQ-WRJN-WSAU<br>WHLS | *WMBR-WATL▲WRDO-WCBM<br>▲WLLH↓WABY-WBNY-WSYS<br>WMFD-WDAS-WRAK-WPRA<br>WBTM-WBLK-WCOS |
| H Reno, Nev..........M | ***WKBH** La Crosse, Wis.....O | 1380 | | **WSMK** Dayton, Ohio......J<br>‡**WALA** Mobile Ala........M | **WNBC** New Britain, Conn..K<br>**KQV** Pittsburgh, Pa.......M |
| LC Lewiston, Ida..K<br>Y Phoenix, Ariz.........O | ***KLRA** Little Rock, Ark....O | 1390 | | ↓▲**WHK** Cleveland, Ohio....O | **WQDM** St Albans, Vt......O |
| O Ogden, U.. (***KHBC**) M | ***KTUL** Tulsa, Okla........O | 1400 | | †**WIRE** Indianapolis, Ind. ..O | **WARD-WVFW-WBBC** NY M |
| ED Medford, Ore.......K<br>NC Amarillo, Tex.......O | **KFJM** Grand Forks, N.D..M<br>**WROK** Rockford, Ill......M | 1410 | | **WBCM** Bay City, Mich....M<br>***WSFA** Montgomery, Ala.. M | ▲**WAAB** Boston, Mass...... M<br>**WHIS** Bluefield, W. Va.....K |
| MA-KSAN-KRBM▲KORE<br>PS-KXL-KEUB-KGIW<br>W-KWBG-KRLH-KATE<br>AK | KCMC-KLBM-WJBO-WMBH<br>▲KGFF-KABR-KRBC-KNET<br>KIUN-KABC*WACO-KFIZ<br>KDNT-KFAM-KRIC-KTRI | 1420 | | WMSD-WHFC-WCBS-WLAP<br>WPAD↓WELL-WMBC-WJMS<br>WAPO*WPAR-WSLI-WHMA | WILM-WMFJ-WGPC-WAGM<br>*WMAS-WEED↓WLEU WFMJ<br>WAZL-WMBS-WPRP-WCHV<br>WGNC |
| NY Juneau, Alaska.....K<br>CA Los Angeles, Cal....O | ↓▲**KSO** Des Moines, Ia......K<br>**KGNF** No. Platte, Neb......O | 1430 | | ***WBNS** Columbus, Ohio... O<br>↓**WMPS** Memphis, Tenn....M | ***WHEC** Rochester (***WOKO**) M<br>***WHP** Harrisburg, Pa......M |
| LA Centralia, Wash....M<br>FN Casper, Wyo.......M | ***WMBD** Peoria, Ill.........O<br>↓**KXYZ** Houston, Tex........O | 1440 | | ***WBIG** Greensboro, N. C...M | ‡**WSAN-WCBA** Allentown . M |
| EM Eureka, Cal........M<br>CX Wolf Point, Mont...O | **KCMO** Kansas City, Mo...O<br>‡**KTBS** Shreveport, La......O | 1450 | | ***WGAR** Cleveland, Ohio...M<br>↓**WAGA** Atlanta, Ga........O | ▲**WSAR** Fall River, Mass....O<br>**WHOM** Jersey City, N. J..K |
| | †**KSTP** St. Paul, Minn...... T | 1460 | | | ***WJSV** Washington, D. C...T |
| A Spokane, Wash. .....S | | 1470 | | ***WLAC** Nashville, Tenn....S | **WMEX** Boston, Mass.......S |
| | ***KOMA** Okla. City, Okla....S | 1480 | | **WHIP** Hammond, Ind......S | ***WKBW** Buffalo, N. Y......S |
| BK Sacramento, Cal....T | | 1490 | | ‡**WCKY** Cincinnati, O..... T | |
| AM-KBKR-KROD-KYCA<br>Q▲KXO▲KVOE▲KDB<br>WM-KOVC▲KRNR-KUTA<br>AL-KWEW-KVWC | KOTN*WKBB-WTMV-KPAB<br>KPLC*KDAL-KGKY▲KBIX<br>*KNOW-KBST-KNEL-KGFI<br>KYSM-KPLT-KGKB-WGIL | 1500 | | WHBB-WKBV-WJBK-WKBZ<br>WOMI-WOPI-WDAN | ▲WNLC*WRDW-WKEU WRGA<br>WGKV*WNBF-WCNW-WSPT<br>WWRL*WDNC‡WGAL-WWSW<br>WSYB†WRTD-WKAT |
| | | 1510 | | **CKCR** Waterloo, Ont..... H | **CFRC** Kingston, Ont......H |
| | **KITE** Kansas City, Mo..... O | 1530 | | | ▲**WBRY** Waterbury, Conn... O |
| MC Bakersfield, Cal . O | | 1550 | | | **WQXR** New York, N.Y.....O |

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| | 9.34 | HBL | Geneva, Switzerland | Mon. | — | — | — | — | — | — | — | — | ▼▼ | — | — | — | 9.43 COCH Havana, Cuba |
| | 9.49 | EAR | Madrid, Spain | SuT&T | — | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼ | — | |
| | 9.50 | VK3ME | Melbourne, Aus. | ex.Su. | — | — | — | — | ▲▲ | ▲▲ | ▲▲ | — | — | — | — | — | 9.50 XEWW Mexico City |
| | 9.51 | HJU | Buenaventura, Col. | MW&F | — | — | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | — | |
| | 9.51 | GSB | London, Eng. | Daily | — | — | — | — | ▼▼ | ▼▼ | — | ▼▼ | ▼ | ▼ | ▼▼ | ▼ | |
| | 9.52 | HJ6ABH | Armenia, Col. | Daily | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — | — | |
| | 9.52 | ZBW-3 | HongHong, China | Daily | — | — | — | — | ▲▲ | ▲▲ | ▲▲ | ▲▲ | ▲▲ | ▲▲ | — | — | |
| | 9.52 | OZF | Copenhagen, Den. | Daily | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — | — | — | — | — | 9.53 XEDQ Guadalajara, Mex. |
| | 9.53 | LKC | Oslo, Norway | Daily | — | — | — | — | — | ▲▲ | ▲▲ | ▲▲ | — | — | — | — | 9.53 W2XAF Schenectady |
| | 9.54 | DJN | Berlin, Ger. | Daily | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — | |
| | 9.55 | OLR3A | Prague, Czech. | MTT&F | — | — | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼ | — | 9.55 XEFT VeraCruz, Mex. |
| | 9.56 | DJA | Berlin, Ger. | Daily | ▲▲ | ▲▲ | ▲▲ | ▲▲ | ▲▲ | ◆◆ | ◆◆ | ◆◆ | ◆◆ | ◆◆ | ◆◆ | — | |
| | 9.57 | KZRM | Manila, P. I. | Daily | ▲▲ | ▲▲ | ▲▲ | ▲▲ | ▲▲ | ▲▲ | ▲▲ | ▲▲ | ▲ | ▼ | ▼▼ | ▼▼ | 9.57 W1XK Springfield, Mass. |
| | 9.58 | VLR | Melbourne, Aus. | ex Su. | — | — | — | ▲ | ▲▲ | ▲▲ | ▲▲ | ▲▲ | ▲▲ | — | — | — | |
| | 9.58 | GSC | London, Eng. | Daily | — | — | — | — | — | — | ▼ | ▼▼ | ▼ | ▼ | ▼▼ | ▼ | 9.59 W3XAU Philadelphia |
| | 9.59 | PCJ | Eindhoven, Holland | M&Tu. | — | — | — | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼ | 9.59 W2XE New York, N.Y. |
| | 9.59 | VK2ME | Sydney, Aus. | Sun. | — | — | — | — | ▲ | ▲▲ | ▲▲ | ▲▲ | ▲ | — | — | — | |
| | 9.60 | RAN | Moscow, USSR | Daily | — | — | — | — | — | — | — | ▼▼ | ▼▼ | — | — | — | |
| | 9.60 | HP5J | Panama City | Daily | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼ | — | — | |
| | 9.62 | HJ1ABP | Cartagena, Col. | Daily | — | — | — | — | ▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — | — | |
| | 9.62 | ZRK | Johannesburg, S.Af. | ex.Sa. | ▲▲ | — | — | — | — | — | — | — | — | — | — | ▼ | |
| | 9.63 | HJ7ABD | Bucaramanga, Col. | Daily | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼ | |
| | 9.63 | I 2RO3 | Rome, Italy | Daily | ▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — | — | — | |
| | 9.64 | HH3W | Port-au-Pr., Haiti | ex.Su. | — | — | — | — | — | — | — | ▼▼ | ▼ | — | — | — | |
| | 9.65 | CS2WA | Lisbon, Port. | T, T&Sa. | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | — | — | — | — | — | |
| | 9.66 | LRX | BuenosAires, Arg. | Daily | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼◆ | ◆▲ | ▲▲ | |
| | 9.67 | T14-NRH | Heredia, CR. | TuTh&Sa | — | — | — | — | — | — | — | — | — | ▼▼ | — | — | 9.67 W3XAL Bound Brk, N. J. |
| | 9.68 | TGWA | Guatemala City | Daily | — | — | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | |
| | 9.70 | Fort de Fracne, | Martinique | Daily | — | — | — | — | — | — | ▼ | ▼▼ | ▼▼ | — | — | — | 9.73 COCQ Havana, Cuba |
| | 9.83 | IRF | Rome, Italy | Daily | — | — | — | — | — | — | — | ▼ | ▼▼ | — | — | — | |
| | 9.86 | EAQ | Madrid, Spain | Daily | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼ | — | — | — | 9.86 COCM Havana, Cuba |
| | 9.94 | JDY | Darien, Manchukuo | Daily | — | — | — | — | — | — | — | ▲▲ | — | — | — | — | |
| | 9.95 | CSW | Lisbon, Port. | Daily | — | — | — | — | — | ▼▼ | ▼▼ | — | — | — | — | — | 10.00 COBC Havana, Cuba |
| | 10.22 | PSH | Rio de Janeiro, Brazil | ex.Su. | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | — | — | — | |
| | 10.37 | EAJ-43 | Santa Cruz, Can. Is. | Daily | — | — | — | — | — | — | — | — | ▼▼ | — | — | — | |
| | 11.00 | PLP | Bandoeng, Java | Daily | — | — | — | — | — | ▲ | ◆◆ | ◆▲ | ▲▲ | ▲▲ | ▲▲ | ▲▲ | |
| | 11.04 | CSW | Lisbon, Port. | Daily | — | — | ▼▼ | ▼▼ | ▼▼ | — | — | — | — | — | — | — | |
| | 11.53 | SPD | Warsaw, Poland | Daily | — | — | — | — | — | — | ▼▼ | ▼▼ | — | — | — | — | |
| | 11.70 | HP5A | Panama City | Daily | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ◆◆ | ◆◆ | ◆◆ | ◆◆ | ▲▲ | ▲▲ | |
| | 11.72 | TPA 4 | Paris, France | Daily | — | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | 11.72 CJRX Winnipeg, Man. |
| | 11.75 | GSD | London, Eng. | Daily | — | — | — | — | ▼▼ | ▼▼ | ▼ | ▼▼ | ▼ | ▼ | — | ▼ | 11.74 COCX Havana, Cuba |
| | 11.77 | DJD | Berlin, Ger. | Daily | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — | 11.79 W1XAL Boston, Mass. |
| | 11.80 | OER3 | Vienna, Ger. | Daily | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — | — | — | — | ▲▲ | ▲▲ | ▲▲ | 11.80 COGF Matanzas, Cuba |
| | 11.80 | JZJ | Tokyo, Japan | Daily | — | ▲ | — | — | ▼ | ▼ | — | ▲▲ | ▲ | — | — | — | |
| | 11.81 | I 2RO 4 | Rome, Italy | Daily | ▼ | — | — | — | — | ▲▲ | ▲▲ | ▲▲ | ▲ | — | ▲▲ | ▲▲ | 11.83 W9XAA Chicago, Ill. |
| | 11.84 | OLR4A | Prague, Czech | MTT&F | — | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | — | — | 11.83 W2XE New York City |
| | 11.85 | DJP | Berlin, Germany | Daily | — | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — | |
| | 11.86 | GSE | London, Eng. | Daily | — | — | — | — | — | — | ▲▲ | ▲▲ | ▲▲ | ▲▲ | ▲▲ | ▲▲ | 11.87 W8XK Pittsburgh, Pa. |
| | 11.88 | TPB 7 | Paris, France | Daily | — | — | — | — | — | — | — | — | — | ▼ | ▼▼ | ▼▼ | 11.89 XEWI Mexico City |
| | 11.91 | CD1190 | Valdivia, Chile | Daily | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — | — | |
| | S12.00 | RNE | Moscow, USSR | Daily | — | — | — | — | — | — | ▲▲ | ▲▲ | ◆◆ | ▲▲ | ▼▼ | — | |
| | A13.63 | SPW | Warsaw, Pol. | ex.Sa. | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | — | — | — | |
| | 15.11 | DJL | Berlin, Ger. | Daily | — | — | — | — | — | — | — | — | ▲▲ | ▲▲ | — | — | |
| | 15.15 | YDC | Sourabaya, Java | Daily | — | — | — | — | — | ▲ | ▲▲ | ▲▲ | ▲▲ | ▲▲ | ▲▲ | — | 15.16 XEWW Mexico City |
| | 15.18 | GSO | London, Eng. | Daily | — | — | — | — | ▼▼ | ▼▼ | ▼ | ▼▼ | ▼ | — | — | — | |
| | 15.20 | DJB | Berlin, Ger. | Daily | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | 15.21 W8XK Pittsburgh, Pa. |
| | 15.24 | TPA 2 | Paris, France | Daily | — | — | — | — | — | ▲▲ | ▲▲ | ▲▲ | ▲▲ | ▲▲ | — | — | 15.25 W1XAL Boston. Mass. |
| | 15.28 | DJQ | Berlin, Ger. | Daily | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | 15.27 W2XE New York City |
| | 15.31 | GSP | London, Eng. | Daily | — | — | ▼▼ | ▼▼ | ▼ | ▼▼ | ▼▼ | — | — | — | — | — | |
| | 15.34 | DJR | Berlin, Ger. | Daily | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | 15.33 W2XAD Schenectady |
| | S15.37 | HAS 3 | Budapest, Hung. | Sun. | — | — | — | — | — | — | — | — | — | ▲▲ | — | — | |
| | 17.77 | PHI | Huisen, Hol., | ex.Wed. | — | — | — | — | — | — | — | — | ▲ | ▲▲ | — | — | 17.76 W2XE New York |
| | 17.79 | GSG | London, Eng. | Daily | ▼ | ▼▼ | ▼▼ | ▼▼ | — | — | — | — | — | — | — | — | 17.78 W3XAL Boundbr'k, N.J. |
| | 21.47 | GSH | London, Eng. | Daily | — | — | — | — | — | ▲ | ▲▲ | ▲▲ | ▲▲ | ▲▲ | ▲▲ | ▲▲ | 21.52 W2XE New York City |
| | 21.53 | GSJ | London, Eng. | Daily | — | — | — | — | — | ▲ | ▲▲ | ▲▲ | ▲▲ | ▲▲ | ▲ | — | 21.54 W8XK Pittsburgh, Pa. |

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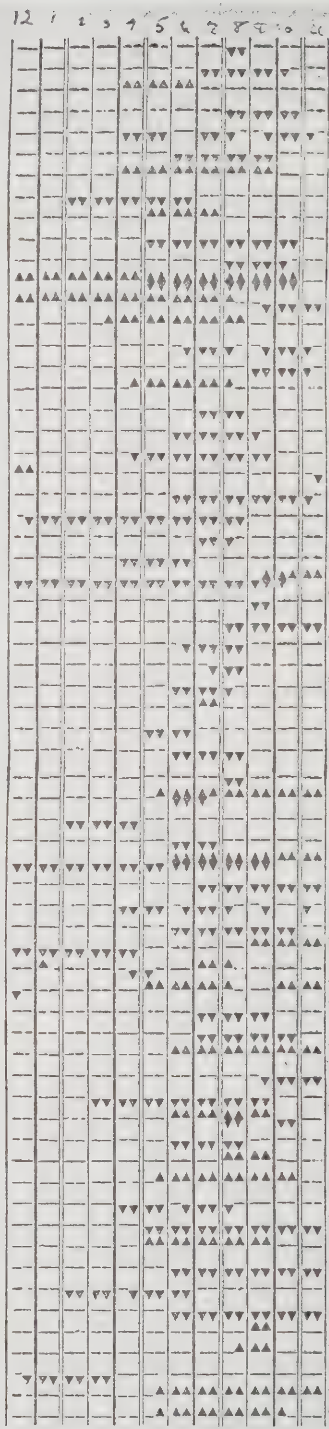

| | Freq. | Call | Location | Schedule | | |
|---|---|---|---|---|---|---|
| ______ | 9.34 | HBL | Geneva, Switzerland | Mon. | 9.43 COCH | Havana, Cuba |
| ______ | 9.49 | EAR | Madrid, Spain | SuT&T | | |
| ______ | 9.50 | VK3ME | Melbourne,Aus. | ex.Su. | 9.50 XEWW | Mexico City |
| ______ | 9.51 | HJU | Buenaventura,Col. | MW&F | | |
| ______ | 9.51 | GSB | London, Eng. | Daily | ______ | |
| ______ | 9.52 | HJ6ABH | Armenia,Col. | Daily | ______ | |
| ______ | 9.52 | ZBW-3 | HongHong,China | Daily | ______ | |
| ______ | 9.52 | OZF | Copenhagen, Den. | Daily | 9.53 XEDQ | Guadalajara,Mex. |
| ______ | 9.53 | LKC | Oslo,Norway | Daily | 9.53 W2XAF | Schenectady |
| ______ | 9.54 | DJN | Berlin, Ger. | Daily | | |
| ______ | 9.55 | OLR3A | Prague, Czech. | MTT&F | 9.55 XEFT | VeraCruz,Mex. |
| ______ | 9.56 | DJA | Berlin, Ger. | Daily | | |
| ______ | 9.57 | KZRM | Manila, P. I. | Daily | 9.57 W1XK | Springfield,Mass. |
| ______ | 9.58 | VLR | Melbourne,Aus. | ex Su. | | |
| ______ | 9.58 | GSC | London, Eng. | Daily | 9.59 W3XAU | Philadelphia |
| ______ | 9.59 | PCJ | Eindhoven, Holland | M&Tu. | 9.59 W2XE | New York, N.Y. |
| ______ | 9.59 | VK2ME | Sydney,Aus. | Sun. | ______ | |
| ______ | 9.60 | RAN | Moscow, USSR | Daily | ______ | |
| ______ | 9.60 | HP5J | Panama City | Daily | ______ | |
| ______ | 9.62 | HJ1ABP | Cartagena, Col. | Daily | ______ | |
| ______ | 9.62 | ZRK | Johannesburg, S.Af. | ex.Sa. | ______ | |
| ______ | 9.63 | HJ7ABD | Bucaramanga,Col. | Daily | ______ | |
| ______ | 9.63 | I 2RO3 | Rome,Italy | Daily | ______ | |
| ______ | 9.64 | HH3W | Port-au-Pr., Haiti | ex.Su. | ______ | |
| ______ | 9.65 | CS2WA | Lisbon,Port. | T,T&Sa. | ______ | |
| ______ | 9.66 | LRX | BuenosAires,Arg. | Daily | | |
| ______ | 9.67 | T14-NRH | Heredia,CR. | TuTh&Sa | 9.67 W3XAL | Bound Brk,N. J. |
| ______ | 9.68 | TGWA | Guatemala City | Daily | | |
| ______ | 9.70 | Fort de Fracne, | Martinique | Daily | 9.73 COCQ | Havana, Cuba |
| ______ | 9.83 | IRF | Rome, Italy | Daily | | |
| ______ | 9.86 | EAQ | Madrid, Spain | Daily | 9.86 COCM | Havana, Cuba |
| ______ | 9.94 | JDY | Darien, Manchukuo | Daily | | |
| ______ | 9.95 | CSW | Lisbon, Port. | Daily | 10.00 COBC | Havana, Cuba |
| ______ | 10.22 | PSH | Rio de Janeiro,Brazil | ex.Su. | ______ | |
| ______ | 10.37 | EAJ-43 | Santa Cruz,Can. Is. | Daily | ______ | |
| ______ | 11.00 | PLP | Bandoeng, Java | Daily | ______ | |
| ______ | 11.04 | CSW | Lisbon, Port. | Daily | ______ | |
| ______ | 11.53 | SPD | Warsaw, Poland | Daily | ______ | |
| ______ | 11.70 | HP5A | Panama City | Daily | | |
| ______ | 11.72 | TPA 4 | Paris, France | Daily | 11.72 CJRX | Winnipeg,Man. |
| ______ | 11.75 | GSD | London, Eng. | Daily | 11.74 COCX | Havana, Cuba |
| ______ | 11.77 | DJD | Berlin, Ger. | Daily | 11.79 W1XAL | Boston,Mass. |
| ______ | 11.80 | OER3 | Vienna, Ger. | Daily | 11.80 COGF | Matanzas,Cuba |
| ______ | 11.80 | JZJ | Tokyo, Japan | Daily | | |
| ______ | 11.81 | I 2RO 4 | Rome, Italy | Daily | 11.83 W9XAA | Chicago,Ill. |
| ______ | 11.84 | OLR4A | Prague,Czech | MTT&F | 11.83 W2XE | New York City |
| ______ | 11.85 | DJP | Berlin, Germany | Daily | | |
| ______ | 11.86 | GSE | London, Eng. | Daily | 11.87 W8XK | Pittsburgh, Pa. |
| ______ | 11.88 | TPB 7 | Paris, France | Daily | 11.89 XEWI | Mexico City |
| ______ | 11.91 | CD1190 | Valdivia, Chile | Daily | | |
| ______ | S12.00 | RNE | Moscow, USSR | Daily | ______ | |
| ______ | A13.63 | SPW | Warsaw.Pol. | ex.Sa. | ______ | |
| ______ | 15.11 | DJL | Berlin, Ger. | Daily | ______ | |
| ______ | 15.15 | YDC | Sourabaya,Java | Daily | 15.16 XEWW | Mexico City |
| ______ | 15.18 | GSO | London, Eng. | Daily | | |
| ______ | 15.20 | DJB | Berlin, Ger. | Daily | 15.21 W8XK | Pittsburgh,Pa. |
| ______ | 15.24 | TPA 2 | Paris, France | Daily | 15.25 W1XAL | Boston. Mass. |
| ______ | 15.28 | DJQ | Berlin,Ger. | Daily | 15.27 W2XE | New York City |
| ______ | 15.31 | GSP | London, Eng. | Daily | | |
| ______ | 15.34 | DJR | Berlin, Ger. | Daily | 15.33 W2XAD | Schenectady |
| ______ | S15.37 | HAS 3 | Budapest,Hung. | Sun. | | |
| ______ | 17.77 | PHI | Huisen,Hol., | ex.Wed. | 17.76 W2XE | New York |
| ______ | 17.79 | GSG | London,Eng. | Daily | 17.78 W3XAL | Boundbr'k, N.J. |
| ______ | 21.47 | GSH | London, Eng. | Daily | 21.52 W2XE | New York Citv |
| ______ | 21.53 | GSJ | London, Eng. | Daily | 21.54 W8XK | Pittsburgh,Pa. |

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|---|---|---|---|---|---|
| **WJAG** Norfolk, Nebr......O | ‡**KTHS** Hot Springs, Ark..T | 1060 | | | ↓▲**WBAL** Baltimore, Md...T |
| **KJBS** San Francisco, Cal.. M | **WCAZ** Carthage, Ill. .......H | 1070 | | †**WTAM** Cleveland, Ohio. W | |
| | | 1080 | | **WMBI-WCBD** Chicago, Ill.. S | ***WBT** Charlotte, N. C....W |
| | ***KMOX** St. Louis, Mo... W | 1090 | | | |
| **CBR** Vancouver, B. C......S<br>▲**KGDM** Stockton, Cal......O | ***KWKH** Shreveport, La. ...T | 1100 | | | **WBIL** New York City......S<br>***WPG** Atlantic City, N. J....S |
| | **KSOO** Sioux Falls, S. D....S | 1110 | | **XELO** Piedras Negras, Mex. W | *▲**WRVA** Richmond, Va.. W |
| **KFIO** Spok'e, Wash. (**KRSC**) H<br>**KFSG-KRKD** Los Angeles M | **CKX** Brandon, Man........O<br>**WTAW** College Station, Tex M | 1120 | | ***WISN** Milwaukee, Wis......K<br>↓**WJBO** Baton Rouge, La...M | **WCOP** Boston, Mass .....M<br>†**WDEL** Wilmington, Del....K |
| ***KSL** Salt Lake City, Utah. W | **KTBC** Austin, Tex...O | 1130 | | **WJJD** Chicago, Ill.........U | **WOV** New York City......O |
| | ‡**KVOO** Tulsa, Okla......V | 1140 | | ***WAPI** Birmingham, Ala. ...S | ▲**WSPR** Springfield, Mass...M |
| | **XEH** Monterey, Mex......K | 1150 | | | ↓**WHAM** Rochester, N.Y. W |
| | **XED** Guadalajara, Mex....M | 1160 | | ↓**WOWO** Ft. Wayne, Ind....T | ***WWVA** Wheeling, W. Va....S |
| | | 1170 | | | ***WCAU** Philadelphia, Pa. W |
| ↓**KEX** Portland, Ore.........S<br>‡**KOB** Albuquerque, N. M...T | ▲**WDGY** Minneapolis, Minn.. O | 1180 | | ***WMAZ** Macon, Ga........ O | **WINS** New York City...... O |
| **KTKC** Viscalia, Cal......K | ‡**WOAI** San Antonio, Tex. W | 1190 | | **WSAZ** Huntington, W. Va. O | |
| **KSUN-KGFJ-KVCV▲KVEC**<br>‡**KWG-KFXD-KDNC▲KOOS**<br>▲**KVOS‡KELO-KGVL-KFXJ**<br>**KGCI-KVNU-KAST** | **KBTM-KGHI-KGEK**<br>**KFJB-KMLB-WBNO-WJBW**<br>**KWNO-KGDE-WIL**<br>▲**KADA-WBBZ-WCAT-WDSM** | 1200 | | **WJHL**<br>**WBHP-WJRD-WJBC-WJBL**<br>**WWAE-WFAM-WMPC-WHBC**<br>**WCPO-WHBY-WCLO WTOL** | ▲**WTHT*WJNO-WRBL-WAYX**<br>**WABI*WIBX-WMFR-WOLS**<br>**WFTC-WEST-WKBO-WSAL**<br>***WAIM WCAX WLVA WENY** |
| **KGLU**<br>▲**KDON-KPPC*KROY▲KFXM**<br>‡**KPFA-KLAH-KFJI▲KGY**<br>**KHBG▲KASA-KWTN-KWJB** | **KFPW-WHBF*KGLO-KIUL**<br>**KANS*WMFG-WGRM-WGCM**<br>**KFVS▲KFOR-KDLR▲KVSO**<br>**KALB-WJMC-KOCA-WIBU** | 1210 | | **WJBY-WCRW-WEDC-WSBC**<br>**WEBQ-WTAX-WHBU↓WJIM**<br>**WJW‡WCOL-WBLY-WALR**<br>**WSIX-WCOV-WOMT-WRAL** | **WFOY-WPAX-WJEJ-WBRB**<br>**WSNJ-WGNY-WGBB↓WJTN**<br>**WSAY-WFAS‡WSOC-WKOK**<br>▲**WBAX WBBL▲WHAI-WOCB** |
| **KTW** Seattle...(**KWSC**)...O | ↓**WREN-KFKU** Kansas City O | 1220 | | ***WDAE** Tampa, Fla........O | †▲**WCAE** Pittsburgh (**WCAD**) O |
| **CJOC** Lethbridge, Alta.....H<br>**KYA** San Francisco, Cal....O | ‡**KGBX** Springfield, Mo....M<br>**KGGM** Albuquerque, N.M. O | 1230 | | ***WFBM** Indianapolis, Ind...O | †**WNAC** Boston, Mass.......O<br>▲**WOL** Washington, D.C.....O |
| **KGCU** Manden No. Dakota K<br>‡**KTFI** Twin Falls, Idaho ..M | ▲**KTAT** Ft. Worth, Tex.....O | 1240 | | ↓**WXYZ** Detroit, Mich......O<br>**XEKL** Leon, Mex.........M | **CJCB** Sydney, N.S.........O<br>**WKAQ** San Juan, P. R.....O |
| ▲**KIT** Yakima, Wash........M<br>**KFOX** Long Beach, Cal....O | ↓**WTCN** Minneapolis, Minn..O<br>**KXOK** St. Louis, Mo.......O | 1250 | | **WEST** New Castle, Pa.....K<br>↓**WDSU** New Orleans, La....O | **WNEW** New York (**WHBI**) O<br>**WAIR** Winston-Salem, N.C. K |
| ▲**KGVO** Missoula, Mont....O<br>**KVOA** Tucson, Arizona. ...O<br>**KHSL** Chico, Cal......K | ↓▲**KOIL** Omaha, Nebr...... O<br>**KPAC** Port Arthur (‡**KRGV**) O | 1260 | | ***WHIO** Dayton, O.........O<br>***WTOC** Savannah, Ga...... O | ***WNBX** Springfield, Vt......M |
| ▲**KOL** Seattle, Wash.........O | **KWLC-KGCA** Decorah, Ia H<br>***KVOR** Colo. Springs, Colo. .O | 1270 | | ↓**WOOD-WASH** Gr. Rpds..M<br>†**WJDX** Jackson, Miss......O | †**WFBR** Baltimore, Md..... O |
| ▲**KFBB** Great Falls, Mont...O<br>**KLS** Oakland, Cal.........K | ‡**WIBA** Madison, Wis....... O<br>▲**WRR** Dallas, Tex.........M | 1280 | | ***WDOD** Chattanooga, Tenn. O | ***WORC** Worcester, Mass...M<br>**WTNJ-WCAM-WCAP** NJ M |
| -**KDYL** Salt Lake City.....O | ‡**WEBC** Duluth, Minn......O<br>***KTRH** Houston, Tex.......O | 1290 | | ***WJAS** Pittsburgh, Pa......O | **WATR** Waterbury, Conn...K<br>**WNEL** San Juan, P. R.....M |
| **KALE** Portland, Ore....... O<br>**KFAC** Los Angeles, Cal....O | **WHBL** Sheboygan, Wis....M<br>***KFH** Wichita, Kas.........O | 1300 | | ‡**WFBC** Greenville S.C,.....O | **WBBR-WFAB** New York..O<br>**WEVD-WHAZ** New York..O |
| ▲**KARM-KCRJ-KSRO KHUB**<br>**KGEZ-KRQA-KSUB-KPDN**<br>▲**KXRO-KGFW-KBND** | **KCKN-KVOL-KRMD-KOME**<br>**KVOX-KROC-KRBA-KWOS**<br>**KWOC-KRRV-KOCY-KAND**<br>**KFPL‡KTSM-WDAH-KFYO** | 1310 | | ↓**WSGN-WGAU-WAML WGTN**<br>**WCLS-WTRC-WLBC‡WBOW**<br>**WCMI↓WFDF-WBEO-WEXL**<br>**WTJS‡WROL-WEMP-WGH** | **WLAK WTAL▲WNBH*WBRK**<br>▲**WLNH WMBO↓WEBR↓WMFF**<br>***WSJS-WFBG-WSAJ-WJAC**<br>**WHAT-WTEL-WRAW‡WBRE** |
| **KID** Idaho Falls, Idaho....M<br>*▲**KGMB** Honolulu.........O | ***KRNT** Des Moines, Iowa....O<br>‡**KGHF** Pueblo, Colo.........M | 1320 | | ***WADC** Akron, Ohio.......O<br>†**WSMB** New Orleans, La...O | ‡**WORK** York, Pa.........O |
| ▲**KMO** Tacoma, Wash......O<br>▲**KGB** San Diego, Cal.......O | ***KSCJ** Sioux City, Ia.......O<br>‡**KRIS** Corpus Christi, Tex..M | 1330 | | ***WTAQ** Green Bay, Wis....O<br>‡▲**WSAI** Cincinnati, Ohio...O | ***WDRC** Hartford, Conn....O |
| ‡**KGIR** Butte, Mont........M | **KDTH** Dubuque Iowa....M<br>**KGNO** Dodge City Kas....K | 1340 | | ↓**WSPD** Toledo, Ohio.......O<br>***WCOA** Pensacola, Fla......O | ‡▲**WFEA** Manchester N.H. M<br>**WFNC** Kinston, N.C........K |
| ‡**KIDO** Boise, Idaho........O | ↓▲**KWK** St. Louis, Mo.......O | 1350 | | †**WMBG** Richmond, Va....M | **WBNX** New York (**WAWZ**) O |
| **KLPM** Minot, N. D......M<br>**KGER** Long Beach, Cal....O | ▲**KCRC** Enid, Okla........K<br>**WQBC** Vicksburg, Miss....O | 1360 | | **WGES** Chicago, Ill........M<br>***WSBT** South Bend, Ind...M | ***WFBL** Syracuse, N. Y......O<br>‡**WCSC** Charleston, S. C....M |
| ***KGAR‡KERN-KRE-KICA**<br>**KGFL▲KSLM-KOBH**<br>**KRKO-KEEN-KUJ-KWYO**<br>**KIUP-KOKO-KGKL-KRMC** | **KELD-KONO-KTEM-KFGQ**<br>***WOC-KVGB-WMIN*WHLB**<br>**WFOR▲KTOK-KFJZ**<br>**KLUF-KFRO-KMAC-KVRS** | 1370 | | **WMFO-WAGF-WDWS*WEOA**<br>‡**WGL-WGRC-WHDF↓WIBM**<br>**WPAY-WHBQ-WRJN-WSAU**<br>**WHLS** | ***WMBR-WATL▲WRDO-WCBM**<br>▲**WLLH↓WABY-WBNY-WSYS**<br>**WMFD-WDAS-WRAK-WPRA**<br>**WBTM-WBLK-WCOS** |
| ***KOH** Reno, Nev..........M | ***WKBH** La Crosse, Wis.....O | 1380 | | **WSMK** Dayton, Ohio......J<br>‡**WALA** Mobile Ala........M | **WNBC** New Britain, Conn..K<br>**KQV** Pittsburgh, Pa.......M |
| **KRLC** Lewiston, Ida..K<br>***KOY** Phoenix, Ariz........O | ***KLRA** Little Rock, Ark....O | 1390 | | ↓▲**WHK** Cleveland, Ohio....O | **WQDM** St Albans, Vt......O |
| ↓**KLO** Ogden, U..(***KHBC**) M | ***KTUL** Tulsa, Okla........O | 1400 | | †**WIRE** Indianapolis, Ind. ..O | **WARD-WVFW-WBBC** NY M |
| ‡**KMED** Medford, Ore......K<br>‡**KGNC** Amarillo, Tex...... O | **KFJM** Grand Forks, N.D..M<br>**WROK** Rockford, Ill.......M | 1410 | | **WSCM** Bay City, Mich....M<br>***WSFA** Montgomery, Ala.. M | ▲**WAAB** Boston, Mass...... M<br>**WHIS** Bluefield, W.Va.....K |
| **KUMA-KSAN-KRBM▲KORE**<br>**KBPS-KXL-KEUB-KGIW**<br>**KIDW-KWBG-KRLH-KATE**<br>**KVAK** | **KCMC-KLBM-WJBO-WMBH**<br>▲**KGFF-KABR-KRBC-KNET**<br>**KIUN-KABC*WACO-KFIZ**<br>**KDNT-KFAM-KRIC-KTRI** | 1420 | | **WMSD-WHFC-WCBS-WLAP**<br>**WPAD↓WELL-WMBC-WJMS**<br>**WAPO*WPAR-WSLI-WHMA** | **WILM-WMFJ-WGPC-WAGM**<br>***WMAS-WEED↓WLEU WFMJ**<br>**WAZL-WMBS-WPRP-WCHV**<br>**WGNC** |
| **KINY** Juneau, Alaska.....K<br>↓**KECA** Los Angeles, Cal....O | ↓▲**KSO** Des Moines, Ia......K<br>**KGNF** No. Platte, Neb.....O | 1430 | | ***WBNS** Columbus, Ohio... O<br>↓**WMPS** Memphis, Tenn....M | ***WHEC** Rochester (***WOKO**) M<br>***WHP** Harrisburg, Pa.....M |
| ▲**KELA** Centralia, Wash....M<br>**KDFN** Casper, Wyo.......M | ***WMBD** Peoria, Ill........O<br>↓**KXYZ** Houston, Tex.......O | 1440 | | ***WBIG** Greensboro, N. C...M | ‡**WSAN-WCBA** Allentown . M |
| ▲**KIEM** Eureka, Cal.......M<br>**KGCX** Wolf Point, Mont...O | **KCMO** Kansas City, Mo...O<br>‡**KTBS** Shreveport, La......O | 1450 | | ***WGAR** Cleveland, Ohio...M<br>↓**WAGA** Atlanta, Ga.......O | ▲**WSAR** Fall River, Mass....O<br>**WHOM** Jersey City, N. J..K |
| | †**KSTP** St. Paul, Minn......T | 1460 | | | ***WJSV** Washington, D. C...T |
| ↓**KGA** Spokane, Wash......S | | 1470 | | ***WLAC** Nashville, Tenn....S | **WMEX** Boston, Mass.......S |
| | ***KOMA** Okla. City, Okla....S | 1480 | | **WHIP** Hammond, Ind.....S | ***WKBW** Buffalo, N. Y.....S |
| ‡**KFBK** Sacramento, Cal....T | | 1490 | | ‡**WCKY** Cincinnati, O..... T | |
| **KSAM-KBKR-KROD-KYCA**<br>▲**KPQ▲KXO▲KVOE▲KDB**<br>**KAWM-KOVC▲KRNR-KUTA**<br>**KSAL-KWEW-KVWC** | **KOTN*WKBB-WTMV-KPAB**<br>**KPLC*KDAL-KGKY▲KBIX**<br>***KNOW-KBST-KNEL-KGFI**<br>**KYSM-KPLT-KGKB-WGIL** | 1500 | | **WHBB-WKBV-WJBK-WKBZ**<br>**WOMI-WOPI-WDAN** | ▲**WNLC*WRDW-WKEU WRGA**<br>**WGKV*WNBF-WCNW-WSPT**<br>**WWRL*WDNC‡WGAL-WWSW**<br>**WSYB†WRTD-WKAT** |
| | | 1510 | | **CKCR** Waterloo, Ont.....H | **CFRC** Kingston, Ont......H |
| | **KITE** Kansas City, Mo.....O | 1530 | | | ▲**WBRY** Waterbury, Conn...O |
| ▲**KPMC** Bakersfield, Cal ..O | | 1550 | | | **WQXR** New York, N.Y.....O |

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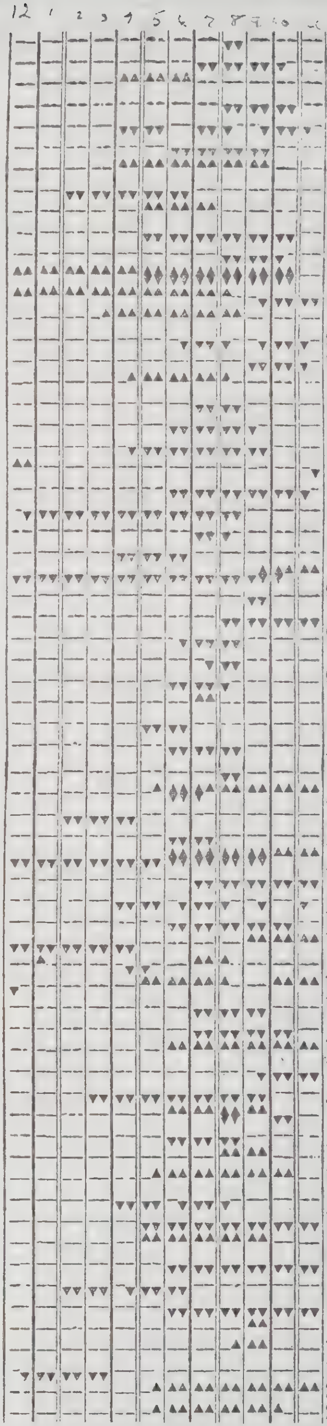
Copy hour numbers from previous page ☛

| Freq. | Call | Location | Days |
|---|---|---|---|
| 9.34 | HBL | Geneva, Switzerland | Mon. |
| 9.49 | EAR | Madrid, Spain | SuT&T |
| 9.50 | VK3ME | Melbourne,Aus. | ex.Su. |
| 9.51 | HJU | Buenaventura,Col. | MW&F |
| 9.51 | GSB | London, Eng. | Daily |
| 9.52 | HJ6ABH | Armenia,Col. | Daily |
| 9.52 | ZBW-3 | HongHong,China | Daily |
| 9.52 | OZF | Copenhagen, Den. | Daily |
| 9.53 | LKC | Oslo,Norway | Daily |
| 9.54 | DJN | Berlin, Ger. | Daily |
| 9.55 | OLR3A | Prague, Czech. | MTT&F |
| 9.56 | DJA | Berlin, Ger. | Daily |
| 9.57 | KZRM | Manila, P. I. | Daily |
| 9.58 | VLR | Melbourne,Aus. | ex Su. |
| 9.58 | GSC | London, Eng. | Daily |
| 9.59 | PCJ | Eindhoven, Holland | M&Tu. |
| 9.59 | VK2ME | Sydney,Aus. | Sun. |
| 9.60 | RAN | Moscow, USSR | Daily |
| 9.60 | HP5J | Panama City | Daily |
| 9.62 | HJ1ABP | Cartagena, Col. | Daily |
| 9.62 | ZRK | Johannesburg, S.Af. | ex.Sa. |
| 9.63 | HJ7ABD | Bucaramanga,Col. | Daily |
| 9.63 | I 2RO3 | Rome,Italy | Daily |
| 9.64 | HH3W | Port-au-Pr., Haiti | ex.Su. |
| 9.65 | CS2WA | Lisbon,Port. | T,T&Sa. |
| 9.66 | LRX | BuenosAires,Arg. | Daily |
| 9.67 | T14-NRH | Heredia,CR. | TuTh&Sa |
| 9.68 | TGWA | Guatemala City | Daily |
| 9.70 | Fort de Fracne, Martinique | | Daily |
| 9.83 | IRF | Rome, Italy | Daily |
| 9.86 | EAQ | Madrid, Spain | Daily |
| 9.94 | JDY | Darien, Manchukuo | Daily |
| 9.95 | CSW | Lisbon, Port. | Daily |
| 10.22 | PSH | Rio de Janeiro,Brazil | ex.Su. |
| 10.37 | EAJ-43 | Santa Cruz,Can. Is. | Daily |
| 11.00 | PLP | Bandoeng, Java | Daily |
| 11.04 | CSW | Lisbon, Port. | Daily |
| 11.53 | SPD | Warsaw, Poland | Daily |
| 11.70 | HP5A | Panama City | Daily |
| 11.72 | TPA 4 | Paris, France | Daily |
| 11.75 | GSD | London, Eng. | Daily |
| 11.77 | DJD | Berlin, Ger. | Daily |
| 11.80 | OER3 | Vienna, Ger. | Daily |
| 11.80 | JZJ | Tokyo, Japan | Daily |
| 11.81 | I 2RO 4 | Rome, Italy | Daily |
| 11.84 | OLR4A | Prague,Czech | MTT&F |
| 11.85 | DJP | Berlin, Germany | Daily |
| 11.86 | GSE | London, Eng. | Daily |
| 11.88 | TPB 7 | Paris, France | Daily |
| 11.91 | CD1190 | Valdivia, Chile | Daily |
| S12.00 | RNE | Moscow,USSR | Daily |
| A13.63 | SPW | Warsaw,Pol. | ex.Sa. |
| 15.11 | DJL | Berlin, Ger. | Daily |
| 15.15 | YDC | Sourabaya,Java | Daily |
| 15.18 | GSO | London, Eng. | Daily |
| 15.20 | DJB | Berlin, Ger. | Daily |
| 15.24 | TPA 2 | Paris, France | Daily |
| 15.28 | DJQ | Berlin,Ger. | Daily |
| 15.31 | GSP | London, Eng. | Daily |
| 15.34 | DJR | Berlin, Ger. | Daily |
| S15.37 | HAS 3 | Budapest,Hung. | Sun. |
| 17.77 | PHI | Huisen,Hol., | ex.Wed. |
| 17.79 | GSG | London,Eng. | Daily |
| 21.47 | GSH | London, Eng. | Daily |
| 21.53 | GSJ | London, Eng. | Daily |



| Freq. | Call | Location |
|---|---|---|
| 9.43 | COCH | Havana, Cuba |
| 9.50 | XEWW | Mexico City |
| 9.53 | XEDQ | Guadalajara,Mex. |
| 9.53 | W2XAF | Schenectady |
| 9.55 | XEFT | VeraCruz,Mex. |
| 9.57 | W1XK | Springfield,Mass. |
| 9.59 | W3XAU | Philadelphia |
| 9.59 | W2XE | New York, N.Y. |
| 9.67 | W3XAL | Bound Brk,N. J. |
| 9.73 | COCQ | Havana, Cuba |
| 9.86 | COCM | Havana, Cuba |
| 10.00 | COBC | Havana, Cuba |
| 11.72 | CJRX | Winnipeg,Man. |
| 11.74 | COCX | Havana, Cuba |
| 11.79 | W1XAL | Boston,Mass. |
| 11.80 | COGF | Matanzas,Cuba |
| 11.83 | W9XAA | Chicago,Ill. |
| 11.83 | W2XE | New York City |
| 11.87 | W8XK | Pittsburgh, Pa. |
| 11.89 | XEWI | Mexico City |
| 15.16 | XEWW | Mexico City |
| 15.21 | W8XK | Pittsburgh,Pa. |
| 15.25 | W1XAL | Boston. Mass. |
| 15.27 | W2XE | New York City |
| 15.33 | W2XAD | Schenectady |
| 17.76 | W2XE | New York |
| 17.78 | W3XAL | Boundbr'k, N.J. |
| 21.52 | W2XE | New York Citv |
| 21.54 | W8XK | Pittsburgh,Pa. |

Canada, Cuba, Mexico and the U.S. have reached an agreement, which, when ratified, will change the frequencies of practically all stations between 540 and 1600 Kilocycles. Subscribers to Haynes' Radio Log at $1.00 for 2½ years will not be inconvenienced by the changes, for they will have new logs in advance. Individual copies are fifteen cents from Haynes' Radio Log, 161 W. Harrison St., Chicago.

| 100 250 300 500 750<br>H K L M N | 1000 1500 2000 2500 5000<br>O P Q R S | WATTS POWER CODE | | 10000 15000 25000 50000<br>T U V W | 100,000 250,000 500,000<br>X Y Z |
|---|---|---|---|---|---|
| WJAG Norfolk, Nebr......O | ‡KTHS Hot Springs, Ark..T | 1060 | | | ↓▲WBAL Baltimore, Md...T |
| KJBS San Francisco, Cal.. M | WCAZ Carthage, Ill. .......H | 1070 | | †WTAM Cleveland, Ohio. W | |
| | | 1080 | | WMBI-WCBD Chicago, Ill.. S | *WBT Charlotte, N. C...W |
| | *KMOX St. Louis, Mo... W | 1090 | | | |
| CBR Vancouver, B. C......S<br>▲KGDM Stockton, Cal......O | *KWKH Shreveport, La. ...T | 1100 | | | WBIL New York City......S<br>*WPG Atlantic City, N.J....S |
| | KSOO Sioux Falls, S. D....S | 1110 | | XELO Piedras Negras, Mex.W | *▲WRVA Richmond, Va.. W |
| KFIO Spok'e, Wash.(KRSC)H<br>KFSG-KRKD Los Angeles M | CKX Brandon, Man........O<br>WTAW College Station, Tex M<br>KTBC Austin, Tex...O | 1120 | | *WISN Milwaukee, Wis......K<br>↓WJBO Baton Rouge, La...M | WCOP Boston, Mass......M<br>†WDEL Wilmington, Del....K |
| *KSL Salt Lake City, Utah. W | | 1130 | | WJJD Chicago, Ill.........U | WOV New York City......O |
| | ‡KVOO Tulsa, Okla......V | 1140 | | *WAPI Birmingham, Ala. ...S | ▲WSPR Springfield, Mass... M |
| | XEH Monterey, Mex......K | 1150 | | | ↓WHAM Rochester, N.Y. W |
| | XED Guadalajara, Mex....M | 1160 | | ↓WOWO Ft. Wayne, Ind....T | *WWVA Wheeling, W. Va....S |
| | | 1170 | | | *WCAU Philadelphia, Pa. W |
| ‡KEX Portland, Ore.........S<br>‡KOB Albuquerque, N. M...T | ▲WDGY Minneapolis, Minn.. O | 1180 | | *WMAZ Macon, Ga........ O | WINS New York City...... O |
| KTKC Viscalia, Cal.......K | ‡WOAI San Antonio, Tex. W | 1190 | | WSAZ Huntington, W. Va. O | |
| KSUN-KGFJ-KVCV▲KVEC<br>‡KWG-KFXD-KDNC▲KOOS<br>▲KVOS‡KELO-KGVL-KFXJ<br>KGCI-KVNU-KAST | KBTM-KGHI-KGEK<br>KFJB-KMLB-WBNO-WJBW<br>KWNO-KGDE-WIL<br>▲KADA-WBBZ-WCAT-WDSM | 1200 | | WJHL<br>WBHP-WJRD-WJBC-WJBL<br>WWAE-WFAM-WMPC-WHBC<br>WCPO-WHBY-WCLO WTOL | ▲WTHT*WJNO-WRBL-WAYX<br>WABI*WIBX-WMFR-WOLS<br>WFTC-WEST-WKBO-WSAL<br>*WAIM WCAX WLVA WENY |
| KGLU<br>▲KDON-KPPC*KROY▲KFXM<br>‡KPFA-KLAH-KFJI▲KGY<br>KHBG▲KASA-KWTN-KWJB | KFPW-WHBF*KGLO-KIUL<br>KANS*WMFG-WGRM-WGCM<br>KFVS▲KFOR-KDLR▲KVSO<br>KALB-WJMC-KOCA-WIBU | 1210 | | WJBY-WCRW-WEDC-WSBC<br>WEBQ-WTAX-WHBU↓WJIM<br>WJW‡WCOL-WBLY-WALR<br>WSIX-WCOV-WOMT-WRAL | WFOY-WPAX-WJEJ-WBRB<br>WSNJ-WGNY-WGBB↓WJTN<br>WSAY-WFAS‡WSOC-WKOK<br>▲WBAX WBBL▲WHAI-WOCB |
| KTW Seattle...(KWSC)...O | ↓WREN-KFKU Kansas City O | 1220 | | *WDAE Tampa, Fla........O | †▲WCAE Pittsburgh(WCAD)O |
| CJOC Lethbridge, Alta.....H<br>KYA San Francisco, Cal....O | ‡KGBX Springfield, Mo....M<br>KGGM Albuquerque, N.M. O | 1230 | | *WFBM Indianapolis, Ind...O | †WNAC Boston, Mass.......O<br>▲WOL Washington, D.C.....O |
| KGCU Manden No. Dakota K<br>‡KTFI Twin Falls, Idaho...M | ▲KTAT Ft. Worth, Tex.....O | 1240 | | ↓WXYZ Detroit, Mich......O<br>XEKL Leon, Mex.........M | CJCB Sydney, N.S.........O<br>WKAQ San Juan, P. R....O |
| ▲KIT Yakima, Wash........M<br>KFOX Long Beach, Cal....O | ↓WTCN Minneapolis, Minn..O<br>KXOK St. Louis, Mo........O | 1250 | | WEST New Castle, Pa.....K<br>↓WDSU New Orleans, La....O | WNEW New York (WHBI) O<br>WAIR Winston-Salem, N.C.K |
| ▲KGVO Missoula, Mont....O<br>KVOA Tucson, Arizona....O<br>KHSL Chico, Cal......K | ↓▲KOIL Omaha, Nebr...... O<br>KPAC Port Arthur(‡KRGV)O | 1260 | | *WHIO Dayton, O.........O<br>*WTOC Savannah, Ga...... O | *WNBX Springfield, Vt.....M |
| ▲KOL Seattle, Wash.........O | KWLC-KGCA Decorah, Ia H<br>*KVOR Colo. Springs, Colo..O | 1270 | | ↓WOOD-WASH Gr. Rpds..M<br>†WJDX Jackson, Miss......O | †WFBR Baltimore, Md..... O |
| ▲KFBB Great Falls, Mont...O<br>KLS Oakland, Cal.........K | ‡WIBA Madison, Wis....... O<br>▲WRR Dallas, Tex..........M | 1280 | | *WDOD Chattanooga, Tenn. O | *WORC Worcester, Mass... M<br>WTNJ-WCAM-WCAP NJ M |
| ▲KDYL Salt Lake City.....O | ‡WEBC Duluth, Minn......O<br>*KTRH Houston, Tex.......O | 1290 | | *WJAS Pittsburgh, Pa......O | WATR Waterbury, Conn...K<br>WNEL San Juan, P. R.....[illegible] |
| KALE Portland, Ore........O<br>KFAC Los Angeles, Cal....O | WHBL Sheboygan, Wis....M<br>*KFH Wichita, Kas.........O | 1300 | | ‡WFBC Greenville S.C......O | WBBR-WFAB New York..O<br>WEVD-WHAZ New York..O |
| ▲KARM-KCRJ-KSRO KHUB<br>KGEZ-KRQA-KSUB-KPDN<br>▲KXRO-KGFW-KBND | KCKN-KVOL-KRMD-KOME<br>KVOX-KROC-KRBA-KWOS<br>KWOC-KRRV-KOCY-KAND<br>KFPL‡KTSM-WDAH-KFYO | 1310 | | ↓WSGN-WGAU-WAML WGTN<br>WCLS-WTRC-WLBC‡WBOW<br>WCMI↓WFDF-WBEO-WEXL<br>WTJS‡WROL-WEMP-WGH | WLAK WTAL▲WNBH*WBRK<br>▲WLNH WMBO↓WEBR↓WMFF<br>*WSJS-WFBG-WSAJ-WJAC<br>WHAT-WTEL-WRAW‡WBRE |
| KID Idaho Falls, Idaho....M<br>*▲KGMB Honolulu........O | *KRNT Des Moines, Iowa....O<br>‡KGHF Pueblo, Colo........M | 1320 | | *WADC Akron, Ohio.......O<br>†WSMB New Orleans, La...O | ‡WORK York, Pa..........O |
| ▲KMO Tacoma, Wash......O<br>▲KGB San Diego, Cal.......O | *KSCJ Sioux City, Ia.......O<br>‡KRIS Corpus Christi, Tex..M | 1330 | | *WTAQ Green Bay, Wis. ...O<br>‡▲WSAI Cincinnati, Ohio... O | *WDRC Hartford, Conn....O |
| ‡KGIR Butte, Mont........M | KDTH Dubuque Iowa....M<br>KGNO Dodge City Kas....K | 1340 | | ↓WSPD Toledo, Ohio.......O<br>*WCOA Pensacola, Fla......O | ‡▲WFEA Manchester N.H. M<br>WFNC Kinston, N.C.......K |
| ‡KIDO Boise, Idaho........O | ↓▲KWK St. Louis, Mo.......O | 1350 | | †WMBG Richmond, Va....M | WBNX New York (WAWZ) O |
| KLPM Minot, N. D......M<br>KGER Long Beach, Cal....O | ▲KCRC Enid, Okla........K<br>WQBC Vicksburg, Miss....O | 1360 | | WGES Chicago, Ill........M<br>*WSBT South Bend, Ind...M | *WFBL Syracuse, N. Y......O<br>‡WCSC Charleston, S. C....M |
| *KGAR‡KERN-KRE-KICA<br>KGFL▲KSLM-KOBH<br>KRKO-KEEN-KUJ-KWYO<br>KIUP-KOKO-KGKL-KRMC | KELD-KONO-KTEM-KFGQ<br>*WOC-KVGB-WMIN*WHLB<br>WFOR▲KTOK-KFJZ<br>KLUF-KFRO-KMAC-KVRS | 1370 | | WMFO-WAGF-WDWS*WEOA<br>‡WGL-WGRC-WHDF↓WIBM<br>WPAY-WHBQ-WRJN-WSAU<br>WHLS | *WMBR-WATL▲WRDO-WCBM<br>▲WLLH↓WABY-WBNY-WSVS<br>WMFD-WDAS-WRAK-WPRA<br>WBTM-WBLK-WCOS |
| *KOH Reno, Nev..........M | *WKBH La Crosse, Wis.....O | 1380 | | WSMK Dayton, Ohio......J<br>‡WALA Mobile Ala.........M | WNBC New Britain, Conn..K<br>KQV Pittsburgh, Pa.......M |
| KRLC Lewiston, Ida..K<br>*KOY Phoenix, Ariz........O | *KLRA Little Rock, Ark....O | 1390 | | ↓▲WHK Cleveland, Ohio....O | WQDM St Albans, Vt......O |
| ↓KLO Ogden, U..(*KHBC)M | *KTUL Tulsa, Okla........ O | 1400 | | †WIRE Indianapolis, Ind. ..O | WARD-WVFW-WBBC NY M |
| ‡KMED Medford, Ore......K<br>‡KGNC Amarillo, Tex...... O | KFJM Grand Forks, N.D..M<br>WROK Rockford, Ill......M | 1410 | | WBCM Bay City, Mich....M<br>*WSFA Montgomery, Ala.. M | ▲WAAB Boston, Mass..... M<br>WHIS Bluefield, W.Va..... K |
| KUMA-KSAN-KRBM▲KORE<br>KBPS-KXL-KEUB-KGIW<br>KIDW-KWBG-KRLH-KATE<br>KVAK | KCMC-KLBM-WJBO-WMBH<br>▲KGFF-KABR-KRBC-KNET<br>KIUN-KABC*WACO-KFIZ<br>KDNT-KFAM-KRIC-KTRI | 1420 | | WMSD-WHFC-WCBS-WLAP<br>WPAD↓WELL-WMBC-WJMS<br>WAPO*WPAR-WSLI-WHMA | WILM-WMFJ-WGPC-WAGM<br>*WMAS-WEED↓WLEU WFMJ<br>WAZL-WMBS-WPRP-WCHV<br>WGNC |
| KINY Juneau, Alaska.....K<br>↓KECA Los Angeles, Cal....O | ↓▲KSO Des Moines, Ia......K<br>KGNF No. Platte, Neb.....O | 1430 | | *WBNS Columbus, Ohio... O<br>↓WMPS Memphis, Tenn...M | *WHEC Rochester(*WOKO) M<br>*WHP Harrisburg, Pa.....M |
| ▲KELA Centralia, Wash....M<br>KDFN Casper, Wyo.......M | *WMBD Peoria, Ill........O<br>↓KXYZ Houston, Tex.......O | 1440 | | *WBIG Greensboro, N. C...M | ‡WSAN-WCBA Allentown. M |
| ▲KIEM Eureka, Cal........M<br>KGCX Wolf Point, Mont...O | KCMO Kansas City, Mo...O<br>‡KTBS Shreveport, La......O | 1450 | | *WGAR Cleveland, Ohio...M<br>↓WAGA Atlanta, Ga....... O | ▲WSAR Fall River, Mass....O<br>WHOM Jersey City, N. J..K |
| | †KSTP St. Paul, Minn...... T | 1460 | | | *WJSV Washington, D. C...T |
| ↓KGA Spokane, Wash......S | | 1470 | | *WLAC Nashville, Tenn....S | WMEX Boston, Mass.......S |
| | *KOMA Okla. City, Okla....S | 1480 | | WHIP Hammond, Ind......S | *WKBW Buffalo, N. Y......S |
| ‡KFBK Sacramento, Cal....T | | 1490 | | ‡WCKY Cincinnati, O..... T | |
| KSAM-KBKR-KROD-KYCA<br>▲KPQ▲KXO▲KVOE▲KDB<br>KAWM-KOVC▲KRNR-KUTA<br>KSAL-KWEW-KVWC | KOTN*WKBB-WTMV-KPAB<br>KPLC*KDAL-KGKY▲KBIX<br>*KNOW-KBST-KNEL-KGFI<br>KYSM-KPLT-KGKB-WGIL | 1500 | | WHBB-WKBV-WJBK-WKBZ<br>WOMI-WOPI-WDAN | ▲WNLC*WRDW-WKEU WRGA<br>WGKV*WNBF-WCNW-WSPT<br>WWRL*WDNC‡WGAL-WWSW<br>WSYB†WRTD-WKAT |
| | | 1510 | | CKCR Waterloo, Ont.....H | CFRC Kingston, Ont......H |
| | KITE Kansas City, Mo..... O | 1530 | | | ▲WBRY Waterbury, Conn...O |
| ▲KPMC Bakersfield, Cal . O | | 1550 | | | WQXR New York, N.Y....O |

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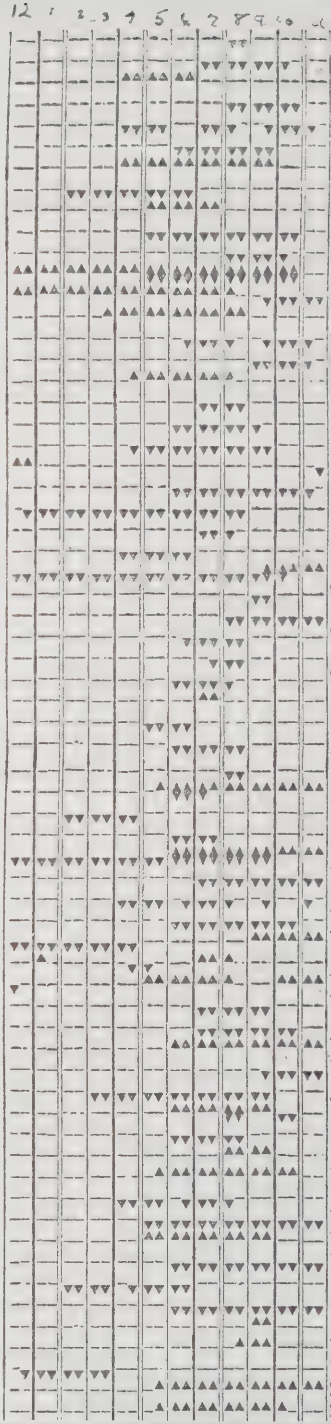
Copy hour numbers from previous page ☞

| Freq. | Call | Location | Days |
|---|---|---|---|
| 9.34 | HBL | Geneva, Switzerland | Mon. |
| 9.49 | EAR | Madrid, Spain | SuT&T |
| 9.50 | VK3ME | Melbourne.Aus. | ex.Su. |
| 9.51 | HJU | Buenaventura,Col. | MW&F |
| 9.51 | GSB | London, Eng. | Daily |
| 9.52 | HJ6ABH | Armenia,Col. | Daily |
| 9.52 | ZBW-3 | HongHong,China | Daily |
| 9.52 | OZF | Copenhagen, Den. | Daily |
| 9.53 | LKC | Oslo,Norway | Daily |
| 9.54 | DJN | Berlin, Ger. | Daily |
| 9.55 | OLR3A | Prague, Czech. | MTT&F |
| 9.56 | DJA | Berlin, Ger. | Daily |
| 9.57 | KZRM | Manila, P. I. | Daily |
| 9.58 | VLR | Melbourne,Aus. | ex Su. |
| 9.58 | GSC | London, Eng. | Daily |
| 9.59 | PCJ | Eindhoven, Holland | M&Tu. |
| 9.59 | VK2ME | Sydney,Aus. | Sun. |
| 9.60 | RAN | Moscow, USSR | Daily |
| 9.60 | HP5J | Panama City | Daily |
| 9.62 | HJ1ABP | Cartagena, Col. | Daily |
| 9.62 | ZRK | Johannesburg, S.Af. | ex.Sa. |
| 9.63 | HJ7ABD | Bucaramanga,Col. | Daily |
| 9.63 | I 2RO3 | Rome,Italy | Daily |
| 9.64 | HH3W | Port-au-Pr., Haiti | ex.Su. |
| 9.65 | CS2WA | Lisbon,Port. | T,T&Sa. |
| 9.66 | LRX | BuenosAires,Arg. | Daily |
| 9.67 | T14-NRH | Heredia,CR. | TuTh&Sa |
| 9.68 | TGWA | Guatemala City | Daily |
| 9.70 | | Fort de Fracne, Martinique | Daily |
| 9.83 | IRF | Rome, Italy | Daily |
| 9.86 | EAQ | Madrid, Spain | Daily |
| 9.94 | JDY | Darien, Manchukuo | Daily |
| 9.95 | CSW | Lisbon, Port. | Daily |
| 10.22 | PSH | Rio de Janeiro,Brazil | ex.Su. |
| 10.37 | EAJ-43 | Santa Cruz,Can. Is. | Daily |
| 11.00 | PLP | Bandoeng, Java | Daily |
| 11.04 | CSW | Lisbon, Port. | Daily |
| 11.53 | SPD | Warsaw, Poland | Daily |
| 11.70 | HP5A | Panama City | Daily |
| 11.72 | TPA 4 | Paris, France | Daily |
| 11.75 | GSD | London, Eng. | Daily |
| 11.77 | DJD | Berlin, Ger. | Daily |
| 11.80 | OER3 | Vienna, Ger. | Daily |
| 11.80 | JZJ | Tokyo, Japan | Daily |
| 11.81 | I 2RO 4 | Rome, Italy | Daily |
| 11.84 | OLR4A | Prague,Czech | MTT&F |
| 11.85 | DJP | Berlin, Germany | Daily |
| 11.86 | GSE | London, Eng. | Daily |
| 11.88 | TPB 7 | Paris, France | Daily |
| 11.91 | CD1190 | Valdivia, Chile | Daily |
| S12.00 | RNE | Moscow,USSR | Daily |
| A13.63 | SPW | Warsaw,Pol. | ex.Sa. |
| 15.11 | DJL | Berlin, Ger. | Daily |
| 15.15 | YDC | Sourabaya,Java | Daily |
| 15.18 | GSO | London, Eng. | Daily |
| 15.20 | DJB | Berlin, Ger. | Daily |
| 15.24 | TPA 2 | Paris, France | Daily |
| 15.28 | DJQ | Berlin,Ger. | Daily |
| 15.31 | GSP | London, Eng. | Daily |
| 15.34 | DJR | Berlin, Ger. | Daily |
| S15.37 | HAS 3 | Budapest,Hung. | Sun. |
| 17.77 | PHI | Huisen,Hol., | ex.Wed. |
| 17.79 | GSG | London,Eng. | Daily |
| 21.47 | GSH | London, Eng. | Daily |
| 21.53 | GSJ | London, Eng. | Daily |



9.43 COCH Havana, Cuba
9.50 XEWW Mexico City
9.53 XEDQ Guadalajara,Mex.
9.53 W2XAF Schenectady
9.55 XEFT VeraCruz,Mex.
9.57 W1XK Springfield,Mass.
9.59 W3XAU Philadelphia
9.59 W2XE New York, N.Y.
9.67 W3XAL Bound Brk,N. J.
9.73 COCQ Havana, Cuba
9.86 COCM Havana, Cuba
10.00 COBC Havana, Cuba
11.72 CJRX Winnipeg,Man.
11.74 COCX Havana, Cuba
11.79 W1XAL Boston,Mass.
11.80 COGF Matanzas,Cuba
11.83 W9XAA Chicago,Ill.
11.83 W2XE New York City
11.87 W8XK Pittsburgh, Pa.
11.89 XEWI Mexico City
15.16 XEWW Mexico City
15.21 W8XK Pittsburgh,Pa.
15.25 W1XAL Boston, Mass.
15.27 W2XE New York City
15.33 W2XAD Schenectady
17.76 W2XE New York
17.78 W3XAL Boundbr'k,N.J.
21.52 W2XE New York Citv
21.54 W8XK Pittsburgh,Pa.

Canada, Cuba, Mexico and the U.S. have reached an agreement, which, when ratified, will change the frequencies of practically all stations between 540 and 1600 Kilocycles. Subscribers to Haynes' Radio Log at $1.00 for 2½ years will not be inconvenienced by the changes, for they will have new logs in advance. Individual copies are fifteen cents from Haynes' Radio Log, 161 W. Harrison St., Chicago.

| 100 250 300 500 750<br>H K L M N | 1000 1500 2000 2500 5000<br>O P Q R S | WATTS POWER CODE | | 10000 15000 25000 50000<br>T U V W | 100,000 250,000 500,000<br>X Y Z |
|---|---|---|---|---|---|
| WJAG Norfolk, Nebr......O | ‡KTHS Hot Springs, Ark..T | 1060 | | | ↓▲WBAL Baltimore, Md...T |
| KJBS San Francisco, Cal.. M | WCAZ Carthage, Ill. .......H | 1070 | | †WTAM Cleveland, Ohio. W | |
| | | 1080 | | WMBI-WCBD Chicago,Ill.. S | *WBT Charlotte, N. C...:W |
| | *KMOX St. Louis, Mo... W | 1090 | | | |
| CBR Vancouver, B. C......S<br>▲KGDM Stockton, Cal......O | *KWKH Shreveport, La. ...T | 1100 | | | WBIL New York City......S<br>*WPG Atlantic City, N.J....S |
| | KSOO Sioux Falls, S. D. ...S | 1110 | | XELO Piedras Negras, Mex. W | *▲WRVA Richmond, Va.. W |
| KFIO Spok'e,Wash.(KRSC)H<br>KFSG-KRKD Los Angeles M | CKX Brandon, Man. ........O<br>WTAW College Station,Tex M<br>KTBC Austin, Tex...O | 1120 | | *WISN Milwaukee. Wis......K<br>↓WJBO Baton Rouge, La...M | WCOP Boston, Mass.......M<br>†WDEL Wilmington, Del....K |
| *KSL Salt Lake City, Utah. W | | 1130 | | WJJD Chicago, Ill.........U | WOV New York City......O |
| | ‡KVOO Tulsa, Okla......V | 1140 | | *WAPI Birmingham, Ala. ...S | ▲WSPR Springfield, Mass...M |
| | XEH Monterey, Mex......K | 1150 | | | ↓WHAM Rochester, N.Y . W |
| | XED Guadalajara, Mex....M | 1160 | | ↓WOWO Ft. Wayne, Ind....T | *WWVA Wheeling, W. Va....S |
| | | 1170 | | | *WCAU Philadelphia, Pa . W |
| ‡KEX Portland, Ore.........S<br>‡KOB Albuquerque, N. M...T | ▲WDGY Minneapolis, Minn.. O | 1180 | | *WMAZ Macon, Ga........ O | WINS New York City...... O |
| KTKC Viscalia, Cal.......K | ‡WOAI San Antonio, Tex. W | 1190 | | WSAZ Huntington, W. Va. O | |
| KSUN-KGFJ-KVCV▲KVEC<br>‡KWG-KFXD-KDNC▲KOOS<br>▲KVOS‡KELO-KGVL-KFXJ<br>KGCI-KVNU-KAST | KBTM-KGHI-KGEK<br>KFJB-KMLB-WBNO-WJBW<br>KWNO-KGDE-WIL<br>▲KADA-WBBZ-WCAT-WDSM | 1200 | | WJHL<br>WBHP-WJRD-WJBC-WJBL<br>WWAE-WFAM-WMPC-WHBC<br>WCPO-WHBY-WCLO WTOL | ▲WTHT*WJNO-WRBL-WAYX<br>WABI*WIBX-WMFR-WOLS<br>WFTC-WEST-WKBO-WSAL<br>* WAIM WCAX WLVA WENY |
| KGLU<br>▲KDON-KPPC*KROY▲KFXM<br>‡KPFA-KLAH-KFJI▲KGY<br>KHBG▲KASA- KWTN-KWJB | KFPW-WHBF*KGLO-KIUL<br>KANS*WMFG-WGRM-WGCM<br>KFVS▲KFOR-KDLR▲KVSO<br>KALB-WJMC-KOCA-WIBU | 1210 | | WJBY-WCRW-WEDC-WSBC<br>WEBQ-WTAX-WHBU↓WJIM<br>WJW‡WCOL-WBLY-WALR<br>WSIX-WCOV-WOMT-WRAL | WFOY-WPAX-WJEJ-WBRB<br>WSNJ-WGNY-WGBB↓WJTN<br>WSAY-WFAS‡WSOC-WKOK<br>▲WBAX WBBL▲WHAI-WOCB |
| KTW Seattle...(KWSC)...O | ↓WREN-KFKU Kansas City O | 1220 | | *WDAE Tampa, Fla........O | †▲WCAE Pittsburgh(WCAD)O |
| CJOC Lethbridge, Alta.....H<br>KYA San Francisco, Cal....O | ‡KGBX Springfield, Mo....M<br>KGGM Albuquerque,N.M. O | 1230 | | *WFBM Indianapolis, Ind...O | †WNAC Boston, Mass.......O<br>▲WOL Washington, D.C.....O |
| KGCU Manden No. Dakota K<br>‡KTFI Twin Falls, Idaho...M | ▲KTAT Ft. Worth, Tex.....O | 1240 | | ↓WXYZ Detroit,Mich.......O<br>XEKL Leon, Mex.........M | CJCB Sydney.N.S.........O<br>WKAQ San Juan, P. R....O |
| ▲KIT Yakima, Wash........M<br>KFOX Long Beach, Cal....O | ↓WTCN Minneapolis, Minn..O<br>KXOK St.Louis. Mo........O | 1250 | | WEST New Castle, Pa.....K<br>↓WDSU New Orleans, La....O | WNEW New York (WHBI) O<br>WAIR Winston-Salem, N.C.K |
| ▲KGVO Missoula, Mont....O<br>KVOA Tucson, Arizona. ...O<br>KHSL Chico, Cal......K | ↓▲KOIL Omaha, Nebr....... O<br>KPAC Port Arthur(‡KRGV)O | 1260 | | *WHIO Dayton, O..........O<br>*WTOC Savannah, Ga...... O | *WNBX Springfield,Vt.....M |
| ▲KOL Seattle, Wash.........O | KWLC-KGCA Decorah, Ia H<br>*KVOR Colo. Springs,.Colo..O | 1270 | | ↓WOOD-WASH Gr. Rpds..M<br>†WJDX Jackson, Miss......O | †WFBR Baltimore, Md..... O |
| ▲KFBB Great Falls, Mont...O<br>KLS Oakland, Cal.........K | ‡WIBA Madison, Wis....... O<br>▲WRR Dallas, Tex.........M | 1280 | | *WDOD Chattanooga, Tenn. O | *WORC Worcester, Mass....M<br>WTNJ-WCAM-WCAP NJ M |
| ▲KDYL Salt Lake City.....O | ‡WEBC Duluth, Minn......O<br>*KTRH Houston, Tex.. ....O | 1290 | | *WJAS Pittsburgh, Pa......O | WATR Waterbury, Conn...M<br>WNEL San Juan. P. R.....M |
| KALE Portland, Ore....... O<br>KFAC Los Angeles, Cal....O | WHBL Sheboygan, Wis....M<br>*KFH Wichita, Kas.........O | 1300 | | ‡WFBC Greenville S.C,.....O | WBBR-WFAB New York..O<br>WEVD-WHAZ New York..O |
| ▲KARM-KCRJ-KSRO KHUB<br>KGEZ-KRQA-KSUB-KPDN<br>▲KXRO-KGFW-KBND | KCKN-KVOL-KRMD-KOME<br>KVOX-KROC-KRBA-KWOS<br>KWOC-KRRV-KOCY-KAND<br>KFPL‡KTSM-WDAH-KFYO | 1310 | | ↓WSGN-WGAU-WAML WGTN<br>WCLS-WTRC-WLBC‡WBOW<br>WCMI↓WFDF-WBEO-WEXL<br>WTJS‡WROL-WEMP-WGH | WLAK WTAL▲WNBH*WBRK<br>▲WLNH WMBO↓WEBR↓WMFF<br>*WSJS-WFBG-WSAJ-WJAC<br>WHAT-WTEL-WRAW‡WBRE |
| KID Idaho Falls, Idaho....M<br>*▲KGMB Honolulu.........O | *KRNT Des Moines,Iowa...,O<br>‡KGHF Pueblo, Colo.........M | 1320 | | *WADC Akron, Ohio.......O<br>†WSMB New Orleans, La...O | ‡WORK York, Pa..........O |
| ▲KMO Tacoma, Wash......O<br>▲KGB San Diego, Cal.......O | *KSCJ Sioux City, Ia.......O<br>‡KRIS Corpus Christi, Tex..M | 1330 | | *WTAQ Green Bay, Wis. ...O<br>‡▲WSAI Cincinnati, Ohio...O | *WDRC Hartford, Conn....O |
| ‡KGIR Butte, Mont........M | KDTH Dubuque. Iowa....M<br>KGNO Dodge City.Kas....K | 1340 | | ↓WSPD Toledo, Ohio.......O<br>*WCOA Pensacola, Fla......O | ‡▲WFEA Manchester N.H. M<br>WFNC Kinston, N.C.... ...K |
| ‡KIDO Boise, Idaho........O | ↓▲KWK St. Louis, Mo.......O | 1350 | | †WMBG Richmond. Va....M | WBNX New York (WAWZ) O |
| KLPM Minot, N. D......M<br>KGER Long Beach, Cal....O | ▲KCRC Enid, Okla......... K<br>WQBC Vicksburg, Miss....O | 1360 | | WGES Chicago, Ill........M<br>*WSBT South Bend, Ind....M | *WFBL Syracuse, N. Y......O<br>‡WCSC Charleston, S. C....M |
| *KGAR‡KERN-KRE-KICA<br>KGFL▲KSLM-KOBH<br>KRKO-KEEN-KUJ-KWYO<br>KIUP-KOKO-KGKL-KRMC | KELD-KONO-KTEM-KFGQ<br>*WOC-KVGB-WMIN*WHLB<br>WFOR▲KTOK-KFJZ<br>KLUF-KFRO-KMAC-KVRS | 1370 | | WMFO-WAGF-WDWS*WEOA<br>‡WGL-WGRC-WHDF↓WIBM<br>WPAY-WHBQ-WRJN-WSAU<br>WHLS | *WMER-WATL▲WRDO-WCBM<br>▲WLLH↓WABY-WBNY-WSVS<br>WMFD-WDAS-WRAK-WPRA<br>WBTM-WBLK-WCOS |
| *KOH Reno, Nev..........M | *WKBH La Crosse, Wis.....O | 1380 | | WSMK Dayton, Ohio......J<br>‡WALA Mobile Ala.........M | WNBC New Britain, Conn..K<br>KQV Pittsburgh, Pa.......M |
| KRLC Lewiston, Ida..K<br>*KOY Phoenix, Ariz.........O | *KLRA Little Rock, Ark....O | 1390 | | ↓▲WHK Cleveland. Ohio....O | WQDM St Albans,Vt......O |
| ↓KLO Ogden, U.. (*KHBC) M | *KTUL Tulsa. Okla........ O | 1400 | | †WIRE Indianapolis, Ind. ..O | WARD-WVFW-WBBC NY M |
| ‡KMED Medford, Ore......K<br>‡KGNC Amarillo, Tex......O | KFJM Grand Forks, N.D..M<br>WROK Rockford, Ill......M | 1410 | | WBCM Bay City, Mich....M<br>*WSFA Montgomery.Ala.. M | ▲WAAB Boston, Mass..... M<br>WHIS Bluefield, W.Va.....K |
| KUMA-KSAN-KRBM▲KORE<br>KBPS-KXL-KEUB-KGIW<br>KIDW-KWBG-KRLH-KATE<br>KVAK | KCMC-KLBM-WJBO-WMBH<br>▲KGFF-KABR-KRBC-KNET<br>KIUN-KABC*WACO-KFIZ<br>KDNT-KFAM-KRIC-KTRI | 1420 | | WMSD-WHFC-WCBS-WLAP<br>WPAD↓WELL-WMBC-WJMS<br>WAPO*WPAR-WSLI-WHMA | WILM-WMFJ-WGPC-WAGM<br>*WMAS-WEED↓WLEU WFMJ<br>WAZL-WMBS-WPRP-WCHV<br>WGNC |
| KINY Juneau, Alaska.....K<br>↓KECA Los Angeles, Cal....O | ↓▲KSO Des Moines, Ia......K<br>KGNF No. Platte, Neb.....O | 1430 | | *WBNS Columbus, Ohio... O<br>↓WMPS Memphis, Tenn....M | *WHEC Rochester(*WOKO) M<br>*WHP Harrisburg, Pa......M |
| ▲KELA Centralia, Wash....M<br>KDFN Casper, Wyo.......M | *WMBD Peoria, Ill.........O<br>↓KXYZ Houston,Tex.......O | 1440 | | *WBIG Greensboro, N. C...M | ‡WSAN-WCBA Allentown . M |
| ▲KIEM Eureka. Cal........M<br>KGCX Wolf Point. Mont...O | KCMO Kansas City, Mo...O<br>‡KTBS Shreveport, La......O | 1450 | | *WGAR Cleveland, Ohio...M<br>↓WAGA Atlanta, Ga....... O | ▲WSAR Fall River, Mass....O<br>WHOM Jersey City, N. J..K |
| | †KSTP St,Paul. Minn...... T | 1460 | | | *WJSV Washington, D. C...T |
| ↓KGA Spokane, Wash. .....S | | 1470 | | *WLAC Nashville, Tenn....S | WMEX Boston,Mass.......S |
| | *KOMA Okla. City, Okla....S | 1480 | | WHIP Hammond, Ind.....S | *WKBW Buffalo, N. Y......S |
| ‡KFBK Sacramento, Cal....T | | 1490 | | ‡WCKY Cincinnati, O..... T | |
| KSAM-KBKR-KROD-KYCA<br>▲KPQ▲KXO▲KVOE▲KDB<br>KAWM-KOVC▲KRNR-KUTA<br>KSAL-KWEW-KVWC | KOTN*WKBB-WTMV-KPAB<br>KPLC*KDAL-KGKY▲KBIX<br>*KNOW-KBST-KNEL-KGFI<br>KYSM-KPLT-KGKB-WGIL | 1500 | | WHBB-WKBV-WJBK-WKBZ<br>WOMI-WOPI-WDAN | ▲WNLC*WRDW-WKEU WRGA<br>WGKV*WNBF-WCNW-WSPT<br>WWRL*WDNC‡WGAL-WWSW<br>WSYB†WRTD-WKAT |
| | | 1510 | | CKCR Waterloo. Ont.....H | CFRC Kingston, Ont......H |
| | KITE Kansas City. Mo.,... O | 1530 | | | ▲WBRY Waterbury, Conn...O |
| ▲KPMC Bakersfield. Cal . O | | 1550 | | | WQXR New York,N.Y....O |

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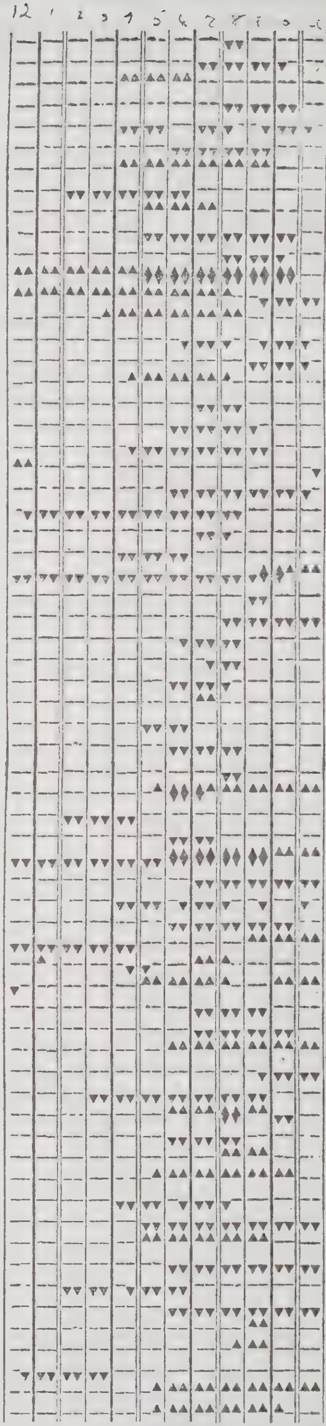

| | Freq. | Call | Location | Schedule | | Freq. | Call | Location |
|---|---|---|---|---|---|---|---|---|
| | 9.34 | HBL | Geneva, Switzerland | Mon. | | 9.43 | COCH | Havana, Cuba |
| | 9.49 | EAR | Madrid, Spain | SuT&T | | | | |
| | 9.50 | VK3ME | Melbourne,Aus. | ex.Su. | | 9.50 | XEWW | Mexico City |
| | 9.51 | HJU | Buenaventura,Col. | MW&F | | | | |
| | 9.51 | GSB | London, Eng. | Daily | | | | |
| | 9.52 | HJ6ABH | Armenia,Col. | Daily | | | | |
| | 9.52 | ZBW-3 | HongHong,China | Daily | | | | |
| | 9.52 | OZF | Copenhagen, Den. | Daily | | 9.53 | XEDQ | Guadalajara,Me |
| | 9.53 | LKC | Oslo,Norway | Daily | | 9.53 | W2XAF | Schenectady |
| | 9.54 | DJN | Berlin, Ger. | Daily | | | | |
| | 9.55 | OLR3A | Prague, Czech. | MTT&F | | 9.55 | XEFT | VeraCruz,Mex. |
| | 9.56 | DJA | Berlin, Ger. | Daily | | | | |
| | 9.57 | KZRM | Manila, P. I. | Daily | | 9.57 | W1XK | Springfield,Mas |
| | 9.58 | VLR | Melbourne,Aus. | ex Su. | | | | |
| | 9.58 | GSC | London, Eng. | Daily | | 9.59 | W3XAU | Philadelphia |
| | 9.59 | PCJ | Eindhoven,Holland | M&Tu. | | 9.59 | W2XE | New York, N.Y |
| | 9.59 | VK2ME | Sydney,Aus. | Sun. | | | | |
| | 9.60 | RAN | Moscow, USSR | Daily | | | | |
| | 9.60 | HP5J | Panama City | Daily | | | | |
| | 9.62 | HJ1ABP | Cartagena, Col. | Daily | | | | |
| | 9.62 | ZRK | Johannesburg, S.Af. | ex.Sa. | | | | |
| | 9.63 | HJ7ABD | Bucaramanga,Col. | Daily | | | | |
| | 9.63 | I 2RO3 | Rome,Italy | Daily | | | | |
| | 9.64 | HH3W | Port-au-Pr., Haiti | ex.Su. | | | | |
| | 9.65 | CS2WA | Lisbon,Port. | T,T&Sa. | | | | |
| | 9.66 | LRX | BuenosAires,Arg. | Daily | | | | |
| | 9.67 | T14-NRH | Heredia,CR. | TuTh&Sa | | 9.67 | W3XAL | Bound Brk,N.J |
| | 9.68 | TGWA | Guatemala City | Daily | | | | |
| | 9.70 | | Fort de Fracne, Martinique | Daily | | 9.73 | COCQ | Havana, Cuba |
| | 9.83 | IRF | Rome, Italy | Daily | | | | |
| | 9.86 | EAQ | Madrid, Spain | Daily | | 9.86 | COCM | Havana, Cuba |
| | 9.94 | JDY | Darien, Manchukuo | Daily | | | | |
| | 9.95 | CSW | Lisbon, Port. | Daily | | 10.00 | COBC | Havana, Cuba |
| | 10.22 | PSH | Rio de Janeiro,Brazil | ex.Su. | | | | |
| | 10.37 | EAJ-43 | Santa Cruz,Can. Is. | Daily | | | | |
| | 11.00 | PLP | Bandoeng, Java | Daily | | | | |
| | 11.04 | CSW | Lisbon, Port. | Daily | | | | |
| | 11.53 | SPD | Warsaw, Poland | Daily | | | | |
| | 11.70 | HP5A | Panama City | Daily | | | | |
| | 11.72 | TPA 4 | Paris, France | Daily | | 11.72 | CJRX | Winnipeg,Man. |
| | 11.75 | GSD | London, Eng. | Daily | | 11.74 | COCX | Havana, Cuba |
| | 11.77 | DJD | Berlin, Ger. | Daily | | 11.79 | W1XAL | Boston,Mass. |
| | 11.80 | OER3 | Vienna, Ger. | Daily | | 11.80 | COGF | Matanzas,Cuba |
| | 11.80 | JZJ | Tokyo, Japan | Daily | | | | |
| | 11.81 | I 2RO 4 | Rome, Italy | Daily | | 11.83 | W9XAA | Chicago,Ill. |
| | 11.84 | OLR4A | Prague,Czech | MTT&F | | 11.83 | W2XE | New York City |
| | 11.85 | DJP | Berlin, Germany | Daily | | | | |
| | 11.86 | GSE | London, Eng. | Daily | | 11.87 | W8XK | Pittsburgh, Pa. |
| | 11.88 | TPB 7 | Paris, France | Daily | | 11.89 | XEWI | Mexico City |
| | 11.91 | CD1190 | Valdivia, Chile | Daily | | | | |
| | S12.00 | RNE | Moscow,USSR | Daily | | | | |
| | A13.63 | SPW | Warsaw,Pol. | ex.Sa. | | | | |
| | 15.11 | DJL | Berlin, Ger. | Daily | | | | |
| | 15.15 | YDC | Sourabaya,Java | Daily | | 15.16 | XEWW | Mexico City |
| | 15.18 | GSO | London, Eng. | Daily | | | | |
| | 15.20 | DJB | Berlin, Ger. | Daily | | 15.21 | W8XK | Pittsburgh,Pa. |
| | 15.24 | TPA 2 | Paris, France | Daily | | 15.25 | W1XAL | Boston. Mass. |
| | 15.28 | DJQ | Berlin,Ger. | Daily | | 15.27 | W2XE | New York City |
| | 15.31 | GSP | London, Eng. | Daily | | | | |
| | 15.34 | DJR | Berlin, Ger. | Daily | | 15.33 | W2XAD | Schenectady |
| | S15.37 | HAS 3 | Budapest,Hung. | Sun. | | | | |
| | 17.77 | PHI | Huisen,Hol., | ex.Wed. | | 17.76 | W2XE | New York |
| | 17.79 | GSG | London,Eng. | Daily | | 17.78 | W3XAL | Boundbr'k, N.J. |
| | 21.47 | GSH | London, Eng. | Daily | | 21.52 | W2XE | New York Citv |
| | 21.53 | GSJ | London, Eng. | Daily | | 21.54 | W8XK | Pittsburgh,Pa. |

Canada, Cuba, Mexico and the U.S. have reached an agreement, which, when ratified, will change the frequencie of practically all stations between 540 and 1600 Kilocycles. Subscribers to Haynes' Radio Log at $1.00 for 2½ year will not be inconvenienced by the changes, for they will have new logs in advance. Individual copies are fiftee cents from Haynes' Radio Log, 161 W. Harrison St., Chicago.

| 100 250 300 500 750<br>H K L M N | 1000 1500 2000 2500 5000<br>O P Q R S | WATTS POWER CODE | | 10000 15000 25000 50000<br>T U V W | 100,000 250,000 500,000<br>X Y Z |
|---|---|---|---|---|---|
| WJAG Norfolk, Nebr......O | ‡KTHS Hot Springs, Ark..T | 1060 | | | ↓▲WBAL Baltimore, Md...T |
| KJBS San Francisco, Cal.. M | WCAZ Carthage, Ill. .......H | 1070 | | †WTAM Cleveland. Ohio. W | |
| | | 1080 | | WMBI-WCBD Chicago,Ill.. S | *WBT Charlotte, N. C....W |
| | *KMOX St. Louis. Mo... W | 1090 | | | |
| CBR Vancouver, B. C......S<br>▲KGDM Stockton, Cal......O | *KWKH Shreveport, La. ...T | 1100 | | | WBIL New York City......S<br>*WPG Atlantic City, N. J....S |
| | KSOO Sioux Falls, S. D....S | 1110 | | XELO Piedras Negras, Mex.W | *▲WRVA Richmond. Va.. W |
| KFIO Spok'e,Wash.(KRSC)H<br>KFSG-KRKD Los Angeles M | CKX Brandon, Man........O<br>WTAW College Station,Tex M<br>KTBC Austin. Tex...O | 1120 | | *WISN Milwaukee.Wis......K<br>↓WJBO Baton Rouge, La...M | WCOP Boston, Mass......M<br>†WDEL Wilmington, Del....K |
| *KSL Salt Lake City, Utah. W | | 1130 | | WJJD Chicago, Ill.........U | WOV New York City......O |
| | ‡KVOO Tulsa, Okla......V | 1140 | | *WAPI Birmingham, Ala. ...S | ▲WSPR Springfield, Mass...M |
| | XEH Monterey, Mex......K | 1150 | | | ↓WHAM Rochester, N.Y. W |
| | XED Guadalajara, Mex....M | 1160 | | ↓WOWO Ft. Wayne, Ind....T | *WWVA Wheeling, W. Va....S |
| | | 1170 | | | *WCAU Philadelphia, Pa. W |
| ↓KEX Portland, Ore.........S<br>‡KOB Albuquerque, N. M...T | ▲WDGY Minneapolis, Minn.. O | 1180 | | *WMAZ Macon, Ga........ O | WINS New York City...... O |
| KTKC Viscalia, Cal.......K | ‡WOAI San Antonio, Tex. W | 1190 | | WSAZ Huntington, W. Va. O | |
| KSUN-KGFJ-KVCV▲KVEC<br>‡KWG-KFXD-KDNC▲KOOS<br>▲KVOS‡KELO-KGVL-KFXJ<br>KGCI-KVNU-KAST | KBTM-KGHI-KGEK<br>KFJB-KMLB-WBNO-WJBW<br>KWNO-KGDE-WIL<br>▲KADA-WBBZ-WCAT-WDSM | 1200 | | WJHL<br>WBHP-WJRD-WJBC-WJBL<br>WWAE-WFAM-WMPC-WHBC<br>WCPO-WHBY-WCLO WTOL | ▲WTHT*WJNO-WRBL-WAYX<br>WABI*WIBX-WMFR-WOLS<br>WFTC-WEST-WKBO-WSAL<br>*WAIM WCAX WLVA WENY |
| KGLU<br>▲KDON-KPPC*KROY▲KFXM<br>‡KPFA-KLAH-KFJI▲KGY<br>KHBG▲KASA-KWTN-KWJB | KFPW-WHBF*KGLO-KIUL<br>KANS*WMFG-WGRM-WGCM<br>KFVS▲KFOR-KDLR▲KVSO<br>KALB-WJMC-KOCA-WIBU | 1210 | | WJBY-WCRW-WEDC-WSBC<br>WEBQ-WTAX-WHBU↓WJIM<br>WJW‡WCOL-WBLY-WALR<br>WSIX-WCOV-WOMT-WRAL | WFOY-WPAX-WJEJ-WBRB<br>WSNJ-WGNY-WGBB↓WJTN<br>WSAY-WFAS‡WSOC-WKOK<br>▲WBAX WBBL▲WHAI-WOCB |
| KTW Seattle...(KWSC)...O | ↓WREN-KFKU Kansas City O | 1220 | | *WDAE Tampa, Fla........O | †▲WCAE Pittsburgh(WCAD) O |
| CJOC Lethbridge, Alta.....H<br>KYA San Francisco, Cal....O | ‡KGBX Springfield, Mo....M<br>KGGM Albuquerque,N.M. O | 1230 | | *WFBM Indianapolis, Ind...O | †WNAC Boston, Mass.......O<br>▲WOL Washington, D.C......O |
| KGCU Mandan No. Dakota K<br>‡KTFI Twin Falls, Idaho...M | ▲KTAT Ft. Worth, Tex.....O | 1240 | | ↓WXYZ Detroit, Mich.......O<br>XEKL Leon, Mex.........M | CJCB Sydney.N.S.........O<br>WKAQ San Juan, P. R....O |
| ▲KIT Yakima, Wash.......M<br>KFOX Long Beach, Cal....O | ↓WTCN Minneapolis, Minn..O<br>KXOK St.Louis. Mo........O | 1250 | | WEST New Castle, Pa.....K<br>↓WDSU New Orleans, La....O | WNEW New York (WHBI) O<br>WAIR Winston-Salem, N.C.K |
| ▲KGVO Missoula, Mont....O<br>KVOA Tucson, Arizona....O<br>KHSL Chico, Cal.....K | ↓▲KOIL Omaha, Nebr.......O<br>KPAC Port Arthur(‡KRGV) O | 1260 | | *WHIO Dayton, O.........O<br>*WTOC Savannah, Ga......O | *WNBX Springfield,Vt.....M |
| ▲KOL Seattle, Wash........O | KWLC-KGCA Decorah, Ia H<br>*KVOR Colo. Springs,.Colo..O | 1270 | | ↓WOOD-WASH Gr. Rpds..M<br>†WJDX Jackson, Miss.......O | †WFBR Baltimore, Md..... O |
| ▲KFBB Great Falls, Mont...O<br>KLS Oakland, Cal.........K | ‡WIBA Madison, Wis.......O<br>▲WRR Dallas, Tex.........M | 1280 | | *WDOD Chattanooga, Tenn. O | *WORC Worcester, Mass...M<br>WTNJ-WCAM-WCAP NJ M |
| ‡KDYL Salt Lake City.....O | ‡WEBC Duluth, Minn.......O<br>*KTRH Houston, Tex.......O | 1290 | | *WJAS Pittsburgh, Pa......O | WATR Waterbury, Conn...K<br>WNEL San Juan, P. R.....M |
| KALE Portland, Ore.......O<br>KFAC Los Angeles, Cal....O | WHBL Sheboygan, Wis....M<br>*KFH Wichita, Kas.........O | 1300 | | ‡WFBC Greenville S.C,.....O | WBBR-WFAB New York..O<br>WEVD-WHAZ New York..O |
| ▲KARM-KCRJ-KSRO KHUB<br>KGEZ-KRQA-KSUB-KPDN<br>▲KXRO-KGFW-KBND | KCKN-KVOL-KRMD-KOME<br>KVOX-KROC-KRBA-KWOS<br>KWOC-KRRV-KOCY-KAND<br>KFPL‡KTSM-WDAH-KFYO | 1310 | | ↓WSGN-WGAU-WAML WGTN<br>WCLS-WTRC-WLBC‡WBOW<br>WCMI↓WFDF-WBEO-WEXL<br>WTJS‡WROL-WEMP-WGH | WLAK WTAL▲WNBH*WBRK<br>▲WLNH WMBO↓WEBR↓WMFF<br>*WSJS-WFBG-WSAJ-WJAC<br>WHAT-WTEL-WRAW‡WBRE |
| KID Idaho Falls, Idaho....M<br>*▲KGMB Honolulu.........O | *KRNT Des Moines,Iowa...O<br>‡KGHF Pueblo, Colo........M | 1320 | | *WADC Akron, Ohio........O<br>†WSMB New Orleans, La...O | ‡WORK York, Pa..........O |
| ▲KMO Tacoma, Wash......O<br>▲KGB San Diego, Cal.......O | *KSCJ Sioux City, Ia........O<br>‡KRIS Corpus Christi, Tex..M | 1330 | | *WTAQ Green Bay, Wis....O<br>‡▲WSAI Cincinnati, Ohio...O | *WDRC Hartford, Conn....O |
| ‡KGIR Butte, Mont........M | KDTH Dubuque Iowa....M<br>KGNO Dodge City Kas....K | 1340 | | ↓WSPD Toledo, Ohio.......O<br>*WCOA Pensacola, Fla......O | ‡▲WFEA Manchester N.H. M<br>WFNC Kinston, N.C.......K |
| ‡KIDO Boise, Idaho.........O | ↓▲KWK St. Louis, Mo.......O | 1350 | | †WMBG Richmond, Va....M | WBNX New York (WAWZ) O |
| KLPM Minot, N. D......M<br>KGER Long Beach, Cal....O | ▲KCRC Enid, Okla........K<br>WQBC Vicksburg, Miss....O | 1360 | | WGES Chicago, Ill........M<br>*WSBT South Bend, Ind....M | *WFBL Syracuse, N. Y......O<br>‡WCSC Charleston, S. C....M |
| *KGAR‡KERN-KRE-KICA<br>KGFL▲KSLM-KOBH<br>KRKO-KEEN-KUJ-KWYO<br>KIUP-KOKO-KGKL-KRMC | KELD-KONO-KTEM-KFGQ<br>*WOC-KVGB-WMIN*WHLB<br>WFOR▲KTOK-KFJZ<br>KLUF-KFRO-KMAC-KVRS | 1370 | | WMFO-WAGF-WDWS*WECA<br>‡WGL-WGRC-WHDF↓WIBM<br>WPAY-WHBQ-WRJN-WSAU<br>WHLS | *WMBR-WATL▲WRDO-WCBM<br>▲WLLH↓WABY-WBNY-WSYB<br>WMFD-WDAS-WRAK-WPRA<br>WBTM-WBLK-WCOS |
| *KOH Reno, Nev..........M | *WKBH La Crosse, Wis.....O | 1380 | | WSMK Dayton, Ohio......J<br>‡WALA Mobile Ala........M | WNBC New Britain, Conn..K<br>KQV Pittsburgh, Pa.......M |
| KRLC Lewiston, Ida..K<br>*KOY Phoenix, Ariz........O | *KLRA Little Rock, Ark....O | 1390 | | ↓▲WHK Cleveland, Ohio....O | WQDM St Albans,Vt......O |
| ↓KLO Ogden, U..(*KHBC) M | *KTUL Tulsa Okla........O | 1400 | | †WIRE Indianapolis, Ind. ..O | WARD-WVFW-WBBC NY M |
| ‡KMED Medford, Ore......K<br>‡KGNC Amarillo, Tex......O | KFJM Grand Forks, N.D..M<br>WROK Rockford, Ill.......M | 1410 | | WBCM Bay City, Mich....M<br>*WSFA Montgomery.Ala.. M | ▲WAAB Boston, Mass...... M<br>WHIS Bluefield.W.Va.....K |
| KUMA-KSAN-KRBM▲KORE<br>KBPS-KXL-KEUB-KGIW<br>KIDW-KWBG-KRLH-KATE<br>KVAK | KCMC-KLBM-WJBO-WMBH<br>▲KGFF-KABR-KRBC-KNET<br>KIUN-KABC*WACO-KFIZ<br>KDNT-KFAM-KRIC-KTRI | 1420 | | WMSD-WHFC-WCBS-WLAP<br>WPAD↓WELL-WMBC-WJMS<br>WAPO*WPAR-WSLI-WHMA | WILM-WMFJ-WGPC-WAGM<br>*WMAS-WEED↓WLEU WFMJ<br>WAZL-WMBS-WPRP-WCHV<br>WGNC |
| KINY Juneau, Alaska.....K<br>↓KECA Los Angeles, Cal....O | ↓▲KSO Des Moines, Ia......K<br>KGNF No. Platte, Neb......O | 1430 | | *WBNS Columbus, Ohio... O<br>↓WMPS Memphis, Tenn....M | *WHEC Rochester(*WOKO) M<br>*WHP Harrisburg, Pa......M |
| ▲KELA Centralia, Wash....M<br>KDFN Casper, Wyo.......M | *WMBD Peoria, Ill.........O<br>↓KXYZ Houston,Tex.......O | 1440 | | *WBIG Greensboro, N. C...M | ‡WSAN-WCBA Allentown . M |
| ▲KIEM Eureka. Cal........M<br>KGCX Wolf Point. Mont...O | KCMO Kansas City, Mo...O<br>‡KTBS Shreveport, La.......O | 1450 | | *WGAR Cleveland, Ohio...M<br>↓WAGA Atlanta, Ga.......O | ▲WSAR Fall River, Mass....O<br>WHOM Jersey City, N. J..K |
| | †KSTP St.Paul. Minn...... T | 1460 | | | *WJSV Washington, D.C...T |
| ↓KGA Spokane, Wash. .....S | | 1470 | | *WLAC Nashville, Tenn....S | WMEX Boston,Mass.......S |
| | *KOMA Okla. City, Okla....S | 1480 | | WHIP Hammond, Ind......S | *WKBW Buffalo, N. Y......S |
| ‡KFBK Sacramento. Cal....T | | 1490 | | ‡WCKY Cincinnati, O..... T | |
| KSAM-KBKR-KROD-KYCA<br>▲KPQ▲KXO▲KVOE▲KDB<br>KAWM-KOVC▲KRNR-KUTA<br>KSAL-KWEW-KVWC | KOTN*WKBB-WTMV-KPAB<br>KPLC*KDAL-KGKY▲KBIX<br>*KNOW-KBST-KNEL-KGFI<br>KYSM-KPLT-KGKB-WGIL | 1500 | | WHBB-WKBV-WJBK-WKBZ<br>WOMI-WOPI-WDAN | ▲WNLC*WRDW-WKEU WRGA<br>WGKV*WNBF-WCNW-WSPT<br>WWRL*WDNC‡WGAL-WWSW<br>WSYB†WRTD-WKAT |
| | | 1510 | | CKCR Waterloo. Ont.....H | CFRC Kingston, Ont......H |
| | KITE Kansas City. Mo.....O | 1530 | | | ▲WBRY Waterbury, Conn...O |
| ▲KPMC Bakersfield. Cal ...O | | 1550 | | | WQXR New York,N.Y.....O |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9.34 | HBL | Geneva, Switzerland | Mon. | — | — | — | — | — | — | — | — | ▼▼ | — | — | — | 9.43 COCH Havana, Cuba |
| 9.49 | EAR | Madrid, Spain | SuT&T | — | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼ | — | |
| 9.50 | VK3ME | Melbourne,Aus. | ex.Su. | — | — | — | — | ▲▲ | ▲▲ | ▲▲ | — | — | — | — | — | 9.50 XEWW Mexico City |
| 9.51 | HJU | Buenaventura,Col. | MW&F | — | — | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | — | |
| 9.51 | GSB | London, Eng. | Daily | — | — | — | — | ▼▼ | ▼▼ | — | ▼▼ | ▼ | ▼ | ▼▼ | ▼ | |
| 9.52 | HJ6ABH | Armenia,Col. | Daily | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — | — | |
| 9.52 | ZBW-3 | HongHong,China | Daily | — | — | — | — | ▲▲ | ▲▲ | ▲▲ | ▲▲ | ▲▲ | ▲▲ | — | — | |
| 9.52 | OZF | Copenhagen, Den. | Daily | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — | — | — | — | — | 9.53 XEDQ Guadalajara,Mex. |
| 9.53 | LKC | Oslo,Norway | Daily | — | — | — | — | — | ▲▲ | ▲▲ | ▲▲ | — | — | — | — | 9.53 W2XAF Schenectady |
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| 9.55 | OLR3A | Prague, Czech. | MTT&F | — | — | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼ | — | 9.55 XEFT VeraCruz,Mex. |
| 9.56 | DJA | Berlin, Ger. | Daily | ▲▲ | ▲▲ | ▲▲ | ▲▲ | ▲▲ | ◆◆ | ◆◆ | ◆◆ | ◆◆ | ◆◆ | ◆◆ | — | |
| 9.57 | KZRM | Manila, P. I. | Daily | ▲▲ | ▲▲ | ▲▲ | ▲▲ | ▲▲ | ▲▲ | ▲▲ | ▲▲ | ▲ | ▼ | ▼▼ | ▼▼ | 9.57 W1XK Springfield,Mass. |
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| 9.59 | PCJ | Eindhoven, Holland | M&Tu. | — | — | — | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼ | 9.59 W2XE New York, N.Y. |
| 9.59 | VK2ME | Sydney,Aus. | Sun. | — | — | — | — | ▲ | ▲▲ | ▲▲ | ▲▲ | ▲ | — | — | — | |
| 9.60 | RAN | Moscow, USSR | Daily | — | — | — | — | — | — | — | ▼▼ | ▼▼ | — | — | — | |
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| 9.65 | CS2WA | Lisbon,Port. | T,T&Sa. | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | — | — | — | — | — | |
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| 9.67 | T14-NRH | Heredia,CR. | TuTh&Sa | — | — | — | — | — | — | — | — | — | ▼▼ | — | — | 9.67 W3XAL Bound Brk,N. J. |
| 9.68 | TGWA | Guatemala City | Daily | — | — | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | |
| 9.70 | | Fort de Fracne, Martinique | Daily | — | — | — | — | — | — | ▼ | ▼▼ | ▼▼ | — | — | — | 9.73 COCQ Havana, Cuba |
| 9.83 | IRF | Rome, Italy | Daily | — | — | — | — | — | — | — | ▼ | ▼▼ | — | — | — | |
| 9.86 | EAQ | Madrid,Spain | Daily | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼ | — | — | — | 9.86 COCM Havana, Cuba |
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| 11.04 | CSW | Lisbon, Port. | Daily | — | — | ▼▼ | ▼▼ | ▼▼ | — | — | — | — | — | — | — | |
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| 15.24 | TPA 2 | Paris, France | Daily | — | — | — | — | — | ▲▲ | ▲▲ | ▲▲ | ▲▲ | ▲▲ | — | — | 15.25 W1XAL Boston. Mass. |
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| 17.77 | PHI | Huisen,Hol., | ex.Wed. | — | — | — | — | — | — | — | — | ▲ | ▲▲ | — | — | 17.76 W2XE New York |
| 17.79 | GSG | London,Eng. | Daily | ▼ | ▼▼ | ▼▼ | ▼▼ | — | — | — | — | — | — | — | — | 17.78 W3XAL Boundbr'k, N.J. |
| 21.47 | GSH | London, Eng. | Daily | — | — | — | — | — | ▲ | ▲▲ | ▲▲ | ▲▲ | ▲▲ | ▲▲ | ▲▲ | 21.52 W2XE New York Citv |
| 21.53 | GSJ | London, Eng. | Daily | — | — | — | — | — | ▲ | ▲▲ | ▲▲ | ▲▲ | ▲▲ | ▲ | — | 21.54 W8XK Pittsburgh,Pa. |

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| | 9.34 | HBL | Geneva, Switzerland | Mon. | — | — | — | — | — | — | — | — | ▼▼ | — | — | — | 9.43 COCH Havana, Cuba |
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| | 9.50 | VK3ME | Melbourne,Aus. | ex.Su. | — | — | — | — | ▲▲ | ▲▲ | ▲▲ | — | — | — | — | — | 9.50 XEWW Mexico City |
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| | 9.60 | RAN | Moscow, USSR | Daily | — | — | — | — | — | — | — | ▼▼ | ▼▼ | — | — | — | |
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| | 17.77 | PHI | Huisen,Hol., | ex.Wed. | — | — | — | — | — | — | — | — | —▲ | ▲▲ | — | — | 17.76 W2XE New York |
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| | 21.47 | GSH | London, Eng. | Daily | — | — | — | — | — | —▲ | ▲▲ | ▲▲ | ▲▲ | ▲▲ | ▲▲ | ▲▲ | 21.52 W2XE New York Ci |
| | 21.53 | GSJ | London, Eng. | Daily | — | — | — | — | — | —▲ | ▲▲ | ▲▲ | ▲▲ | ▲▲ | ▲— | — | 21.54 W8XK Pittsburgh,P |

Canada, Cuba, Mexico and the U.S. have reached an agreement, which, when ratified, will change the frequen of practically all stations between 540 and 1600 Kilocycles. Subscribers to Haynes' Radio Log at $1.00 for 2½ y will not be inconvenienced by the changes, for they will have new logs in advance. Individual copies are fif cents from Haynes' Radio Log, 161 W. Harrison St., Chicago.

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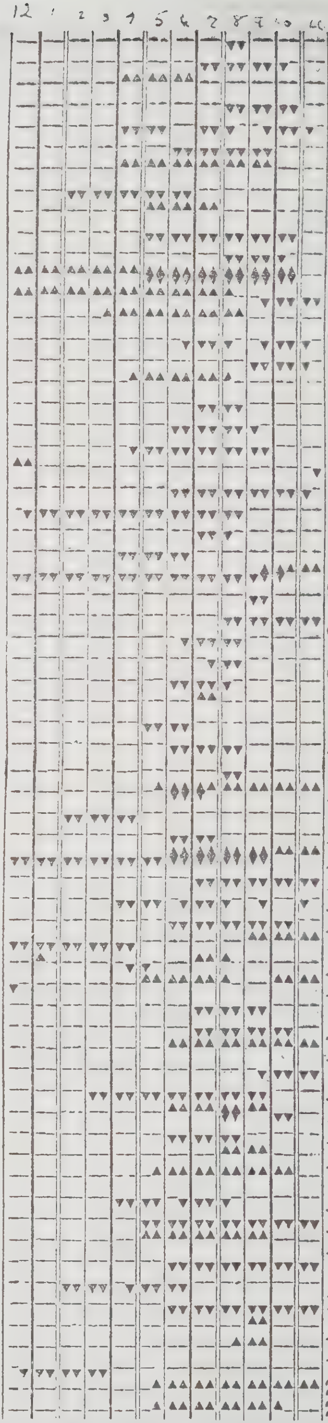
| ______ | 9.34 | HBL | Geneva, Switzerland | Mon. |
| ______ | 9.49 | EAR | Madrid, Spain | SuT&T |
| ______ | 9.50 | VK3ME | Melbourne,Aus. | ex.Su. |
| ______ | 9.51 | HJU | Buenaventura,Col. | MW&F |
| ______ | 9.51 | GSB | London, Eng. | Daily |
| ______ | 9.52 | HJ6ABH | Armenia,Col. | Daily |
| ______ | 9.52 | ZBW-3 | HongHong,China | Daily |
| ______ | 9.52 | OZF | Copenhagen, Den. | Daily |
| ______ | 9.53 | LKC | Oslo,Norway | Daily |
| ______ | 9.54 | DJN | Berlin, Ger. | Daily |
| ______ | 9.55 | OLR3A | Prague, Czech. | MTT&F |
| ______ | 9.56 | DJA | Berlin, Ger. | Daily |
| ______ | 9.57 | KZRM | Manila, P. I. | Daily |
| ______ | 9.58 | VLR | Melbourne,Aus. | ex Su. |
| ______ | 9.58 | GSC | London, Eng. | Daily |
| ______ | 9.59 | PCJ | Eindhoven,Holland | M&Tu. |
| ______ | 9.59 | VK2ME | Sydney,Aus. | Sun. |
| ______ | 9.60 | RAN | Moscow, USSR | Daily |
| ______ | 9.60 | HP5J | Panama City | Daily |
| ______ | 9.62 | HJ1ABP | Cartagena, Col. | Daily |
| ______ | 9.62 | ZRK | Johannesburg, S.Af. | ex.Sa. |
| ______ | 9.63 | HJ7ABD | Bucaramanga,Col. | Daily |
| ______ | 9.63 | I 2RO3 | Rome,Italy | Daily |
| ______ | 9.64 | HH3W | Port-au-Pr., Haiti | ex.Su. |
| ______ | 9.65 | CS2WA | Lisbon,Port. | T,T&Sa. |
| ______ | 9.66 | LRX | BuenosAires,Arg. | Daily |
| ______ | 9.67 | T14-NRH | Heredia,CR. | TuTh&Sa |
| ______ | 9.68 | TGWA | Guatemala City | Daily |
| ______ | 9.70 | | Fort de Fracne, Martinique | Daily |
| ______ | 9.83 | IRF | Rome, Italy | Daily |
| ______ | 9.86 | EAQ | Madrid,Spain | Daily |
| ______ | 9.94 | JDY | Darien, Manchukuo | Daily |
| ______ | 9.95 | CSW | Lisbon, Port. | Daily |
| ______ | 10.22 | PSH | Rio de Janeiro,Brazil | ex.Su. |
| ______ | 10.37 | EAJ-43 | Santa Cruz,Can. Is. | Daily |
| ______ | 11.00 | PLP | Bandoeng, Java | Daily |
| ______ | 11.04 | CSW | Lisbon, Port. | Daily |
| ______ | 11.53 | SPD | Warsaw, Poland | Daily |
| ______ | 11.70 | HP5A | Panama City | Daily |
| ______ | 11.72 | TPA 4 | Paris, France | Daily |
| ______ | 11.75 | GSD | London, Eng. | Daily |
| ______ | 11.77 | DJD | Berlin, Ger. | Daily |
| ______ | 11.80 | OER3 | Vienna, Ger. | Daily |
| ______ | 11.80 | JZJ | Tokyo, Japan | Daily |
| ______ | 11.81 | I 2RO 4 | Rome, Italy | Daily |
| ______ | 11.84 | OLR4A | Prague,Czech | MTT&F |
| ______ | 11.85 | DJP | Berlin, Germany | Daily |
| ______ | 11.86 | GSE | London, Eng. | Daily |
| ______ | 11.88 | TPB 7 | Paris, France | Daily |
| ______ | 11.91 | CD1190 | Valdivia, Chile | Daily |
| ______ | S12.00 | RNE | Moscow, USSR | Daily |
| ______ | A13.63 | SPW | Warsaw,Pol. | ex.Sa. |
| ______ | 15.11 | DJL | Berlin, Ger. | Daily |
| ______ | 15.15 | YDC | Sourabaya,Java | Daily |
| ______ | 15.18 | GSO | London, Eng. | Daily |
| ______ | 15.20 | DJB | Berlin, Ger. | Daily |
| ______ | 15.24 | TPA 2 | Paris, France | Daily |
| ______ | 15.28 | DJQ | Berlin,Ger. | Daily |
| ______ | 15.31 | GSP | London, Eng. | Daily |
| ______ | 15.34 | DJR | Berlin, Ger. | Daily |
| ______ | S15.37 | HAS 3 | Budapest,Hung. | Sun. |
| ______ | 17.77 | PHI | Huisen,Hol., | ex.Wed. |
| ______ | 17.79 | GSG | London,Eng. | Daily |
| ______ | 21.47 | GSH | London, Eng. | Daily |
| ______ | 21.53 | GSJ | London, Eng. | Daily |



9.43 COCH Havana, Cub
9.50 XEWW Mexico Cit
9.53 XEDQ Guadalajara,
9.53 W2XAF Schenectad
9.55 XEFT VeraCruz,M
9.57 W1XK Springfield,M
9.59 W3XAU Philadelphia
9.59 W2XE New York,
9.67 W3XAL Bound Brk,
9.73 COCQ Havana, Cuba
9.86 COCM Havana, Cuba
10.00 COBC Havana, C
11.72 CJRX Winnipeg,M
11.74 COCX Havana, C
11.79 W1XAL Boston,Mas
11.80 COGF Matanzas,C
11.83 W9XAA Chicago,Ill.
11.83 W2XE New York C
11.87 W8XK Pittsburgh,
11.89 XEWI Mexico Cit
15.16 XEWW Mexico Cit
15.21 W8XK Pittsburgh,
15.25 W1XAL Boston. Ma
15.27 W2XE New York C
15.33 W2XAD Schenectac
17.76 W2XE New York
17.78 W3XAL Boundbr'k,
21.52 W2XE New York C
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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 9.34 | HBL | Geneva, Switzerland | Mon. | — | — | — | — | — | — | — | — | ▼▼ | — | — | — | 9.43 COCH Havana, Cub |
| | 9.49 | EAR | Madrid, Spain | SuT&T | — | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼ | — | |
| | 9.50 | VK3ME | Melbourne,Aus. | ex.Su. | — | — | — | — | ▲▲ | ▲▲ | ▲▲ | — | — | — | — | — | 9.50 XEWW Mexico Cit |
| | 9.51 | HJU | Buenaventura,Col. | MW&F | — | — | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | — | |
| | 9.51 | GSB | London, Eng. | Daily | — | — | — | — | ▼▼ | ▼▼ | — | ▼▼ | ▼ | ▼ | ▼▼ | ▼ | |
| | 9.52 | HJ6ABH | Armenia,Col. | Daily | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — | — | |
| | 9.52 | ZBW-3 | HongHong,China | Daily | — | — | — | — | ▲▲ | ▲▲ | ▲▲ | ▲▲ | ▲▲ | ▲▲ | — | — | |
| | 9.52 | OZF | Copenhagen, Den. | Daily | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — | — | — | — | — | 9.53 XEDQ Guadalajara, |
| | 9.53 | LKC | Oslo,Norway | Daily | — | — | — | — | — | ▲▲ | ▲▲ | ▲▲ | — | — | — | — | 9.53 W2XAF Schenectad |
| | 9.54 | DJN | Berlin, Ger. | Daily | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — | |
| | 9.55 | OLR3A | Prague, Czech. | MTT&F | — | — | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼ | — | 9.55 XEFT VeraCruz,M |
| | 9.56 | DJA | Berlin, Ger. | Daily | ▲▲ | ▲▲ | ▲▲ | ▲▲ | ▲▲ | ◆◆ | ◆◆ | ◆◆ | ◆◆ | ◆◆ | ◆◆ | — | |
| | 9.57 | KZRM | Manila, P. I. | Daily | ▲▲ | ▲▲ | ▲▲ | ▲▲ | ▲▲ | ▲▲ | ▲▲ | ▲▲ | ▲ | ▼ | ▼▼ | ▼▼ | 9.57 W1XK Springfield,M |
| | 9.58 | VLR | Melbourne,Aus. | ex Su. | — | — | — | ▲ | ▲▲ | ▲▲ | ▲▲ | ▲▲ | ▲▲ | — | — | — | |
| | 9.58 | GSC | London, Eng. | Daily | — | — | — | — | — | — | ▼ | ▼▼ | ▼ | ▼ | ▼▼ | ▼ | 9.59 W3XAU Philadelphia |
| | 9.59 | PCJ | Eindhoven, Holland | M&Tu. | — | — | — | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼ | 9.59 W2XE New York, |
| | 9.59 | VK2ME | Sydney,Aus. | Sun. | — | — | — | — | ▲ | ▲▲ | ▲▲ | ▲▲ | ▲ | — | — | — | |
| | 9.60 | RAN | Moscow, USSR | Daily | — | — | — | — | — | — | — | ▼▼ | ▼▼ | — | — | — | |
| | 9.60 | HP5J | Panama City | Daily | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼ | — | — | |
| | 9.62 | HJ1ABP | Cartagena, Col. | Daily | — | — | — | — | ▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — | — | |
| | 9.62 | ZRK | Johannesburg, S.Af. | ex.Sa. | ▲▲ | — | — | — | — | — | — | — | — | — | — | ▼ | |
| | 9.63 | HJ7ABD | Bucaramanga,Col. | Daily | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼ | |
| | 9.63 | I 2RO3 | Rome,Italy | Daily | ▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — | — | — | |
| | 9.64 | HH3W | Port-au-Pr., Haiti | ex.Su. | — | — | — | — | — | — | — | ▼▼ | ▼ | — | — | — | |
| | 9.65 | CS2WA | Lisbon,Port. | T,T&Sa. | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | — | — | — | — | — | |
| | 9.66 | LRX | BuenosAires,Arg. | Daily | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼◆ | ◆▲ | ▲▲ | |
| | 9.67 | T14-NRH | Heredia,CR. | TuTh&Sa | — | — | — | — | — | — | — | — | — | ▼▼ | — | — | 9.67 W3XAL Bound Brk, |
| | 9.68 | TGWA | Guatemala City | Daily | — | — | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | |
| | 9.70 | | Fort de Fracne, Martinique | Daily | — | — | — | — | — | — | ▼ | ▼▼ | ▼▼ | — | — | — | 9.73 COCQ Havana, Cuba |
| | 9.83 | IRF | Rome, Italy | Daily | — | — | — | — | — | — | — | ▼ | ▼▼ | — | — | — | |
| | 9.86 | EAQ | Madrid,Spain | Daily | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼ | — | — | — | 9.86 COCM Havana, Cuba |
| | 9.94 | JDY | Darien, Manchukuo | Daily | — | — | — | — | — | — | — | ▲▲ | — | — | — | — | |
| | 9.95 | CSW | Lisbon, Port. | Daily | — | — | — | — | — | ▼▼ | ▼▼ | — | — | — | — | — | 10.00 COBC Havana, C |
| | 10.22 | PSH | Rio de Janeiro,Brazil | ex.Su. | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | — | — | — | |
| | 10.37 | EAJ-43 | Santa Cruz,Can. Is. | Daily | — | — | — | — | — | — | — | — | ▼▼ | — | — | — | |
| | 11.00 | PLP | Bandoeng, Java | Daily | — | — | — | — | — | ▲ | ◆◆ | ◆▲ | ▲▲ | ▲▲ | ▲▲ | ▲▲ | |
| | 11.04 | CSW | Lisbon, Port. | Daily | — | — | ▼▼ | ▼▼ | ▼▼ | — | — | — | — | — | — | — | |
| | 11.53 | SPD | Warsaw, Poland | Daily | — | — | — | — | — | — | ▼▼ | ▼▼ | — | — | — | — | |
| | 11.70 | HP5A | Panama City | Daily | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ◆◆ | ◆◆ | ◆◆ | ◆◆ | ▲▲ | ▲▲ | |
| | 11.72 | TPA 4 | Paris, France | Daily | — | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | 11.72 CJRX Winnipeg, |
| | 11.75 | GSD | London, Eng. | Daily | — | — | — | — | ▼▼ | ▼▼ | ▼ | ▼▼ | ▼ | ▼ | — | ▼ | 11.74 COCX Havana, C |
| | 11.77 | DJD | Berlin, Ger. | Daily | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — | 11.79 W1XAL Boston,Ma |
| | 11.80 | OER3 | Vienna, Ger. | Daily | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — | — | — | — | ▲▲ | ▲▲ | ▲▲ | 11.80 COGF Matanzas, |
| | 11.80 | JZJ | Tokyo, Japan | Daily | — | ▲ | — | — | — | — | — | ▲▲ | ▲ | — | — | — | |
| | 11.81 | I 2RO 4 | Rome, Italy | Daily | ▼ | — | — | — | ▼ | ▼▲▲ | ▲▲ | ▲▲ | ▲ | — | ▲▲ | ▲▲ | 11.83 W9XAA Chicago,Ill |
| | 11.84 | OLR4A | Prague,Czech | MTT&F | — | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | — | — | 11.83 W2XE New York |
| | 11.85 | DJP | Berlin, Germany | Daily | — | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — | |
| | 11.86 | GSE | London, Eng. | Daily | — | — | — | — | — | — | ▲▲ | ▲▲ | ▲▲ | ▲▲ | ▲▲ | ▲▲ | 11.87 W8XK Pittsburgh, |
| | 11.88 | TPB 7 | Paris, France | Daily | — | — | — | — | — | — | — | — | — | ▼ | ▼▼ | ▼▼ | 11.89 XEWI Mexico Cit |
| | 11.91 | CD1190 | Valdivia, Chile | Daily | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — | — | |
| | S12.00 | RNE | Moscow,USSR | Daily | — | — | — | — | — | — | ▲▲ | ▲▲ | ◆◆ | ▲▲ | ▼▼ | — | |
| | A13.63 | SPW | Warsaw,Pol. | ex.Sa. | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | — | — | — | |
| | 15.11 | DJL | Berlin, Ger. | Daily | — | — | — | — | — | — | — | — | ▲▲ | ▲▲ | — | — | |
| | 15.15 | YDC | Sourabaya,Java | Daily | — | — | — | — | — | ▲ | ▲▲ | ▲▲ | ▲▲ | ▲▲ | ▲▲ | — | 15.16 XEWW Mexico Ci |
| | 15.18 | GSO | London, Eng. | Daily | — | — | — | — | ▼▼ | ▼▼ | ▼ | ▼▼ | ▼ | — | — | — | |
| | 15.20 | DJB | Berlin, Ger. | Daily | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | 15.21 W8XK Pittsburgh |
| | 15.24 | TPA 2 | Paris, France | Daily | — | — | — | — | — | ▲▲ | ▲▲ | ▲▲ | ▲▲ | ▲▲ | — | — | 15.25 W1XAL Boston. M |
| | 15.28 | DJQ | Berlin,Ger. | Daily | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | 15.27 W2XE New York |
| | 15.31 | GSP | London, Eng. | Daily | — | — | ▼▼ | ▼▼ | ▼ | ▼▼ | ▼▼ | — | — | — | — | — | |
| | 15.34 | DJR | Berlin, Ger. | Daily | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | 15.33 W2XAD Schenecta |
| | S15.37 | HAS 3 | Budapest,Hung. | Sun. | — | — | — | — | — | — | — | — | — | ▲▲ | — | — | |
| | 17.77 | PHI | Huisen,Hol., | ex.Wed. | — | — | — | — | — | — | — | — | ▲ | ▲▲ | — | — | 17.76 W2XE New York |
| | 17.79 | GSG | London,Eng. | Daily | ▼ | ▼▼ | ▼▼ | ▼▼ | — | — | — | — | — | — | — | — | 17.78 W3XAL Boundbr'k |
| | 21.47 | GSH | London, Eng. | Daily | — | — | — | — | — | ▲ | ▲▲ | ▲▲ | ▲▲ | ▲▲ | ▲▲ | ▲▲ | 21.52 W2XE New York |
| | 21.53 | GSJ | London, Eng. | Daily | — | — | — | — | — | ▲ | ▲▲ | ▲▲ | ▲▲ | ▲▲ | ▲ | — | 21.54 W8XK Pittsburgh, |

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| ____ | 9.34 | HBL | Geneva, Switzerland | Mon. |
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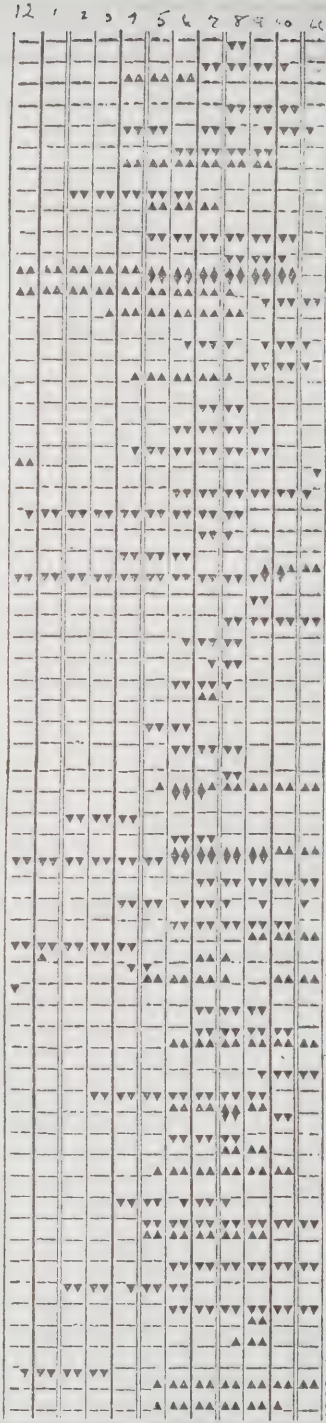
| ____ | 9.51 | GSB | London, Eng. | Daily |
| ____ | 9.52 | HJ6ABH | Armenia,Col. | Daily |
| ____ | 9.52 | ZBW-3 | HongHong,China | Daily |
| ____ | 9.52 | OZF | Copenhagen, Den. | Daily |
| ____ | 9.53 | LKC | Oslo,Norway | Daily |
| ____ | 9.54 | DJN | Berlin, Ger. | Daily |
| ____ | 9.55 | OLR3A | Prague, Czech. | MTT&F |
| ____ | 9.56 | DJA | Berlin, Ger. | Daily |
| ____ | 9.57 | KZRM | Manila, P. I. | Daily |
| ____ | 9.58 | VLR | Melbourne,Aus. | ex Su. |
| ____ | 9.58 | GSC | London, Eng. | Daily |
| ____ | 9.59 | PCJ | Eindhoven, Holland | M&Tu. |
| ____ | 9.59 | VK2ME | Sydney,Aus. | Sun. |
| ____ | 9.60 | RAN | Moscow, USSR | Daily |
| ____ | 9.60 | HP5J | Panama City | Daily |
| ____ | 9.62 | HJ1ABP | Cartagena, Col. | Daily |
| ____ | 9.62 | ZRK | Johannesburg, S.Af. | ex.Sa. |
| ____ | 9.63 | HJ7ABD | Bucaramanga,Col. | Daily |
| ____ | 9.63 | I 2RO3 | Rome,Italy | Daily |
| ____ | 9.64 | HH3W | Port-au-Pr., Haiti | ex.Su. |
| ____ | 9.65 | CS2WA | Lisbon,Port. | T,T&Sa. |
| ____ | 9.66 | LRX | BuenosAires,Arg. | Daily |
| ____ | 9.67 | T14-NRH | Heredia,CR. | TuTh&Sa |
| ____ | 9.68 | TGWA | Guatemala City | Daily |
| ____ | 9.70 | Fort de Fracne, Martinique | | Daily |
| ____ | 9.83 | IRF | Rome, Italy | Daily |
| ____ | 9.86 | EAQ | Madrid, Spain | Daily |
| ____ | 9.94 | JDY | Darien, Manchukuo | Daily |
| ____ | 9.95 | CSW | Lisbon, Port. | Daily |
| ____ | 10.22 | PSH | Rio de Janeiro,Brazil | ex.Su. |
| ____ | 10.37 | EAJ-43 | Santa Cruz,Can. Is. | Daily |
| ____ | 11.00 | PLP | Bandoeng, Java | Daily |
| ____ | 11.04 | CSW | Lisbon, Port. | Daily |
| ____ | 11.53 | SPD | Warsaw, Poland | Daily |
| ____ | 11.70 | HP5A | Panama City | Daily |
| ____ | 11.72 | TPA 4 | Paris, France | Daily |
| ____ | 11.75 | GSD | London, Eng. | Daily |
| ____ | 11.77 | DJD | Berlin, Ger. | Daily |
| ____ | 11.80 | OER3 | Vienna, Ger. | Daily |
| ____ | 11.80 | JZJ | Tokyo, Japan | Daily |
| ____ | 11.81 | I 2RO 4 | Rome, Italy | Daily |
| ____ | 11.84 | OLR4A | Prague,Czech | MTT&F |
| ____ | 11.85 | DJP | Berlin, Germany | Daily |
| ____ | 11.86 | GSE | London, Eng. | Daily |
| ____ | 11.88 | TPB 7 | Paris, France | Daily |
| ____ | 11.91 | CD1190 | Valdivia, Chile | Daily |
| ____ | S12.00 | RNE | Moscow,USSR | Daily |
| ____ | A13.63 | SPW | Warsaw.Pol. | ex.Sa. |
| ____ | 15.11 | DJL | Berlin, Ger. | Daily |
| ____ | 15.15 | YDC | Sourabaya,Java | Daily |
| ____ | 15.18 | GSO | London, Eng. | Daily |
| ____ | 15.20 | DJB | Berlin, Ger. | Daily |
| ____ | 15.24 | TPA 2 | Paris, France | Daily |
| ____ | 15.28 | DJQ | Berlin,Ger. | Daily |
| ____ | 15.31 | GSP | London, Eng. | Daily |
| ____ | 15.34 | DJR | Berlin, Ger. | Daily |
| ____ | S15.37 | HAS 3 | Budapest,Hung. | Sun. |
| ____ | 17.77 | PHI | Huisen,Hol., | ex.Wed. |
| ____ | 17.79 | GSG | London,Eng. | Daily |
| ____ | 21.47 | GSH | London, Eng. | Daily |
| ____ | 21.53 | GSJ | London, Eng. | Daily |



9.43 COCH Havana, Cuba
9.50 XEWW Mexico City
9.53 XEDQ Guadalajara,M
9.53 W2XAF Schenectady
9.55 XEFT VeraCruz,Mex
9.57 W1XK Springfield,Ma
9.59 W3XAU Philadelphia
9.59 W2XE New York, N.
9.67 W3XAL Bound Brk,N
9.73 COCQ Havana, Cuba
9.86 COCM Havana, Cuba
10.00 COBC Havana, Cu
11.72 CJRX Winnipeg,M
11.74 COCX Havana, Cu
11.79 W1XAL Boston,Mass
11.80 COGF Matanzas,C
11.83 W9XAA Chicago,Ill.
11.83 W2XE New York Ci
11.87 W8XK Pittsburgh,
11.89 XEWI Mexico City
15.16 XEWW Mexico City
15.21 W8XK Pittsburgh,
15.25 W1XAL Boston. Mas
15.27 W2XE New York Ci
15.33 W2XAD Schenectad
17.76 W2XE New York
17.78 W3XAL Boundbr'k,
21.52 W2XE New York C
21.54 W8XK Pittsburgh,

Canada, Cuba, Mexico and the U.S. have reached an agreement, which, when ratified, will change the frequer of practically all stations between 540 and 1600 Kilocycles. Subscribers to Haynes' Radio Log at $1.00 for 2½ y will not be inconvenienced by the changes, for they will have new logs in advance. Individual copies are fi cents from Haynes' Radio Log, 161 W. Harrison St., Chicago.

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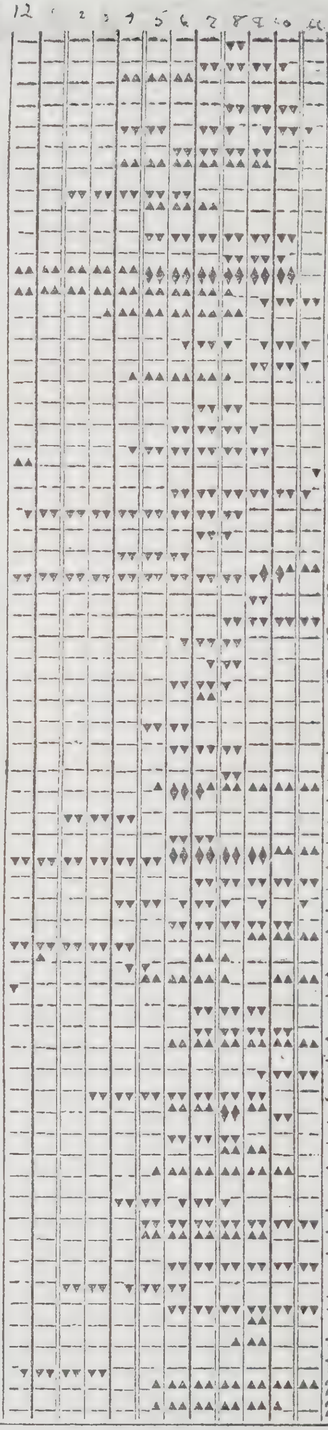

| | | | | | |
|---|---|---|---|---|---|
| ______ | 9.34 HBL | Geneva, Switzerland | Mon. | 9.43 COCH | Havana, Cuba |
| ______ | 9.49 EAR | Madrid, Spain | SuT&T | | |
| ______ | 9.50 VK3ME | Melbourne,Aus. | ex.Su. | 9.50 XEWW | Mexico City |
| ______ | 9.51 HJU | Buenaventura,Col. | MW&F | | |
| ______ | 9.51 GSB | London, Eng. | Daily | ______ | |
| ______ | 9.52 HJ6ABH | Armenia,Col. | Daily | ______ | |
| ______ | 9.52 ZBW-3 | HongHong,China | Daily | ______ | |
| ______ | 9.52 OZF | Copenhagen, Den. | Daily | 9.53 XEDQ | Guadalajara,Me |
| ______ | 9.53 LKC | Oslo,Norway | Daily | 9.53 W2XAF | Schenectady |
| ______ | 9.54 DJN | Berlin, Ger. | Daily | ______ | |
| ______ | 9.55 OLR3A | Prague, Czech. | MTT&F | 9.55 XEFT | VeraCruz,Mex. |
| ______ | 9.56 DJA | Berlin, Ger. | Daily | ______ | |
| ______ | 9.57 KZRM | Manila, P. I. | Daily | 9.57 W1XK | Springfield,Mas |
| ______ | 9.58 VLR | Melbourne,Aus. | ex Su. | ______ | |
| ______ | 9.58 GSC | London, Eng. | Daily | 9.59 W3XAU | Philadelphia |
| ______ | 9.59 PCJ | Eindhoven, Holland | M&Tu. | 9.59 W2XE | New York, N.Y |
| ______ | 9.59 VK2ME | Sydney,Aus. | Sun. | ______ | |
| ______ | 9.60 RAN | Moscow, USSR | Daily | ______ | |
| ______ | 9.60 HP5J | Panama City | Daily | ______ | |
| ______ | 9.62 HJ1ABP | Cartagena, Col. | Daily | ______ | |
| ______ | 9.62 ZRK | Johannesburg, S.Af. | ex.Sa. | ______ | |
| ______ | 9.63 HJ7ABD | Bucaramanga,Col. | Daily | ______ | |
| ______ | 9.63 I 2RO3 | Rome,Italy | Daily | ______ | |
| ______ | 9.64 HH3W | Port-au-Pr., Haiti | ex.Su. | ______ | |
| ______ | 9.65 CS2WA | Lisbon,Port. | T,T&Sa. | ______ | |
| ______ | 9.66 LRX | BuenosAires,Arg. | Daily | ______ | |
| ______ | 9.67 T14-NRH | Heredia,CR. | TuTh&Sa | 9.67 W3XAL | Bound Brk,N. |
| ______ | 9.68 TGWA | Guatemala City | Daily | ______ | |
| ______ | 9.70 | Fort de Fracne, Martinique | Daily | 9.73 COCQ | Havana, Cuba |
| ______ | 9.83 IRF | Rome, Italy | Daily | | |
| ______ | 9.86 EAQ | Madrid,Spain | Daily | 9.86 COCM | Havana, Cuba |
| ______ | 9.94 JDY | Darien, Manchukuo | Daily | | |
| ______ | 9.95 CSW | Lisbon, Port. | Daily | 10.00 COBC | Havana, Cub |
| ______ | 10.22 PSH | Rio de Janeiro,Brazil | ex.Su. | ______ | |
| ______ | 10.37 EAJ-43 | Santa Cruz,Can. Is. | Daily | ______ | |
| ______ | 11.00 PLP | Bandoeng, Java | Daily | ______ | |
| ______ | 11.04 CSW | Lisbon, Port. | Daily | ______ | |
| ______ | 11.53 SPD | Warsaw, Poland | Daily | ______ | |
| ______ | 11.70 HP5A | Panama City | Daily | | |
| ______ | 11.72 TPA 4 | Paris, France | Daily | 11.72 CJRX | Winnipeg,Ma |
| ______ | 11.75 GSD | London, Eng. | Daily | 11.74 COCX | Havana, Cub |
| ______ | 11.77 DJD | Berlin, Ger. | Daily | 11.79 W1XAL | Boston,Mass. |
| ______ | 11.80 OER3 | Vienna, Ger. | Daily | 11.80 COGF | Matanzas,Cu |
| ______ | 11.80 JZJ | Tokyo, Japan | Daily | | |
| ______ | 11.81 I 2RO 4 | Rome, Italy | Daily | 11.83 W9XAA | Chicago,Ill. |
| ______ | 11.84 OLR4A | Prague,Czech | MTT&F | 11.83 W2XE | New York City |
| ______ | 11.85 DJP | Berlin, Germany | Daily | | |
| ______ | 11.86 GSE | London, Eng. | Daily | 11.87 W8XK | Pittsburgh, Pa |
| ______ | 11.88 TPB 7 | Paris, France | Daily | 11.89 XEWI | Mexico City |
| ______ | 11.91 CD1190 | Valdivia, Chile | Daily | | |
| ______ | S12.00 RNE | Moscow,USSR | Daily | ______ | |
| ______ | A13.63 SPW | Warsaw,Pol. | ex.Sa. | ______ | |
| ______ | 15.11 DJL | Berlin, Ger. | Daily | | |
| ______ | 15.15 YDC | Sourabaya,Java | Daily | 15.16 XEWW | Mexico City |
| ______ | 15.18 GSO | London, Eng. | Daily | | |
| ______ | 15.20 DJB | Berlin, Ger. | Daily | 15.21 W8XK | Pittsburgh,Pa |
| ______ | 15.24 TPA 2 | Paris, France | Daily | 15.25 W1XAL | Boston. Mass. |
| ______ | 15.28 DJQ | Berlin,Ger. | Daily | 15.27 W2XE | New York City |
| ______ | 15.31 GSP | London, Eng. | Daily | | |
| ______ | 15.34 DJR | Berlin, Ger. | Daily | 15.33 W2XAD | Schenectady |
| ______ | S15.37 HAS 3 | Budapest,Hung. | Sun. | | |
| ______ | 17.77 PHI | Huisen,Hol., | ex.Wed. | 17.76 W2XE | New York |
| ______ | 17.79 GSG | London,Eng. | Daily | 17.78 W3XAL | Boundbr'k, N. |
| ______ | 21.47 GSH | London, Eng. | Daily | 21.52 W2XE | New York City |
| ______ | 21.53 GSJ | London, Eng. | Daily | 21.54 W8XK | Pittsburgh,Pa |

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# *Silvertone*

## RADIO TIME TABLE AND LOG

*of*

## American
## Broadcast and Short Wave

*and*

## Foreign Short Wave
## Stations

**SEARS ROEBUCK & COMPANY**

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**SEARS ROEBUCK & COMPANY**

Rule out FOUR rows of hour figures, leaving only those for YOUR Time Zone. Then, you'll know when to tune for desired stations. Conversely, by comparing your dial number with data herein, you can often identify those heard by chance. Megacycle numbers are purposely irregular in appearance, with three, two, one or no digits darker to denote the degree of signal strength experienced by the majority of listeners in America. "Local" Stations, which operate almost continuously are listed at the extreme right. "A", "S", and "C" at the left indicate spots used by Amateurs, Ships and AirCraft.

AM-▲ PM-▼ Both-◆

| E D S T | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Eastern (CD) | 12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| E D S T | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| Central | 11 | 12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Mountain | 10 | 11 | 12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| Pacific | 9 | 10 | 11 | 12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |

| | Meg. | Call | Place | |
|---|---|---|---|---|
| | 4.11 | HCJB | Quito, Ecuador | ex.Mon. |
| | 4.76 | HJ2ABJ | Santa Marta, Col. | ex.Su. |
| | 4.78 | HJ1ABB | Barranquilla, Col. | ex.Su. |
| | 4.80 | HJ1ABE | Cartagena, Col. | Daily |
| | 4.82 | HJ7ABB | Bucaramanga, Col. | ex.Su |
| | 4.84 | HJ3ABD | Bogota, Col. | Daily |
| | 4.88 | HJ4ABP | Medellin, Col. | ex.Su. |
| C | 4.90 | HJ3ABH | Bogota, Col. | Daily |
| | 5.80 | YV5RC | Caracas, Venez. | Daily |
| | 5.83 | TIGPH | SanJose, C.R. | ex.Su. |
| | 5.85 | YV1RB | Maracaibo, Ven. | ex.Su. |
| | 5.85 | HI1J | San Pedro, D.R. | Daily |
| | 5.86 | YV4RH | Valencia, Ven. | ex.Su. |
| | 5.87 | HRN | Tegucigalpa, Hon. | Daily |
| | 5.88 | HI9B | Santiago, D.R. | ex.Su. |
| | 5.90 | TILS | San Jose, R.D. | ex.Su. |
| | 5.90 | YV3RA | Barquisimeto, Ven. | ex.Su. |
| | 5.93 | HH2S | Port-au-Pr., Haiti | ex.Su. |
| | 5.93 | YV1RL | Maracaibo, Ven. | ex.Su. |
| | 5.94 | TG2X | Guatemala City | MWSa |
| | 6.00 | HP5K | Colon, Panama | Daily |
| | 6.01 | HJ3ABX | Bogota, Col. | Daily |
| | 6.02 | DJC | Berlin, Ger. | Daily |
| | 6.03 | HP5B | Panama City | Daily |
| | 6.04 | HJ1ABG | Barranquilla, Col. | Daily |
| | 6.05 | HJ6ABA | Pereira, Col. | ex.Su. |
| | 6.05 | GSA | London, Eng. | Daily |
| | 6.07 | OAX4Z | Lima, Peru | ex.Su. |
| | 6.11 | HJ6ABB | Manizales, Col. | ex.Su. |
| | 6.11 | GSL | London, Eng. | Daily |
| | 6.15 | HJ4ABE | Medellin, Col. | Daily |
| | 6.15 | HI5N | Moca City R.D. | ex.Su. |
| | 6.15 | YV5RD | Caracas, Ven. | Daily |
| | 6.21 | TG2 | Guatemala City | ex.Su. |
| | 6.22 | YV1RG | Valera, Venez. | Daily |
| | 6.24 | HRD | LaCeiba, Honduras | ex Su. |
| | 6.24 | HIN | Trujillo, R.D. | ex.Su. |
| | 6.25 | YV5RJ | Caracas, Ven. | ex.Su. |
| | 6.27 | YV5RP | Caracas, Ven. | ex.Su. |
| | 6.29 | HIG | Trujillo City, R.D. | ex.Su. |
| | 6.30 | YV4RD | Maracay, Venez | ex.Su. |
| | 6.31 | HIZ | Trujillo, R.D. | ex.Su. |
| | 6.34 | HI1X | Trujillo, R.D. | Tu.&Fr. |
| | 6.36 | YV1RH | Maracaibo, Ven. | ex.Su. |
| | 6.38 | YV5RF | Caracas, Ven. | ex.Su. |
| | 6.40 | YV5RH | Caracas, Venez | ex.Su. |
| | 6.40 | TGQA | Quezaltenango, Guat. | ex.Su. |
| | 6.41 | TIPG | San Jose, C.R. | Daily |
| | 6.42 | YV6RC | Bolivar, Venez. | ex.Su. |
| | 6.47 | YV3RD | Barquismento, Ven. | Daily |
| | 6.50 | HIL | Trujillo City, R.D. | ex.Su. |
| | 6.52 | YV4RB | Valencia, Venez. | Daily |
| | 6.55 | YV6RB | Bolivar, Venez. | ex.Su. |
| | 6.63 | HIT | Trujillo, R.D. | ex.Su. |
| | 6.63 | HC2RL | Guayaquil, Ec. | Su.&Tu. |
| A | 6.68 | TIEP | SanJose, C.R. | Daily |
| | 7.80 | HBP | Geneva, Switz. | Mon. |
| S | 7.89 | HC1RB | Quito, Ecuador | ex.Su. |
| | 9.12 | HAT-4 | Budapest, Hung. | Su&W. |
| | 9.23 | HC2CW | Guayaquil, Ecu. | ex.Su. |
| | 9.34 | OAX4J | Lima, Peru | Daily |

NOTES

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|---|---|---|
| 6.00 | XEBT | Mexico City. |
| 6.00 | CFCX | Montreal, Que. |
| 6.01 | COCO | Havana, Cuba |
| 6.02 | XEUW | Vera Cruz, Mex. |
| 6.04 | W1XAL | Boston, Mass. |
| 6.06 | W8XAL | Cincinnati |
| 6.06 | W3XAU | Philadelphia |
| 6.07 | CFRX | Toronto, Ont. |
| 6.08 | W9XAA | Chicago |
| 6.09 | CRCX | Toronto, Ont. |
| 6.10 | W9XF | Chicago |
| 6.10 | W3XAL | Boundbr'k, N.J. |
| 6.13 | VE9HX | Halifax, N. S. |
| 6.13 | COCD | Havana, Cuba |
| 6.14 | W8XK | Pittsburgh |
| 6.15 | CJRO | Winnipeg, Man. |
| 6.17 | XEXA | Mexico City |
| 6.28 | COHB | Sancti-Spiritis, Cub |
| 6.34 | COCW | Havana, Cuba |
| 7.38 | XECR | Mexico City |
| 8.66 | COJK | Camaguey, Cuba |
| 8.96 | COKG | Santiago, Cuba |
| 9.00 | COBZ | Havana, Cuba. |

Page Five

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| | Meg. | Call | Place | |
|---|---|---|---|---|
| | 9.34 | HBL | Geneva, Switzerland | Mon. |
| | 9.49 | EAR | Madrid, Spain | SuT&T |
| | 9.50 | VK3ME | Melbourne, Aus. | ex.Su. |
| | 9.51 | HJU | Buenaventura, Col. | MW&F |
| | 9.51 | GSB | London, Eng. | Daily |
| | 9.52 | HJ6ABH | Armenia, Col. | Daily |
| | 9.52 | ZBW-3 | HongHong, China | Daily |
| | 9.52 | OZF | Copenhagen, Den. | Daily |
| | 9.53 | LKC | Oslo, Norway | Daily |
| | 9.54 | DJN | Berlin, Ger. | Daily |
| | 9.55 | OLR3A | Prague, Czech. | MTT&F |
| | 9.56 | DJA | Berlin, Ger. | Daily |
| | 9.57 | KZRM | Manila, P. I. | Daily |
| | 9.58 | VLR | Melbourne, Aus. | ex Su. |
| | 9.58 | GSC | London, Eng. | Daily |
| | 9.59 | PCJ | Eindhoven, Holland | M&Tu. |
| | 9.59 | VK2ME | Sydney, Aus. | Sun. |
| | 9.60 | RAN | Moscow, USSR | Daily |
| | 9.60 | HP5J | Panama City | Daily |
| | 9.62 | HJ1ABP | Cartagena, Col. | Daily |
| | 9.62 | ZRK | Johannesburg, S.Af. | ex.Sa. |
| | 9.63 | HJ7ABD | Bucaramanga, Col. | Daily |
| | 9.63 | I 2RO3 | Rome, Italy | Daily |
| | 9.64 | HH3W | Port-au-Pr., Haiti | ex.Su. |
| | 9.65 | CS2WA | Lisbon, Port. | T,T&Sa. |
| | 9.66 | LRX | BuenosAires, Arg. | Daily |
| | 9.67 | T14-NRH | Heredia, CR. | TuTh&Sa |
| | 9.68 | TGWA | Guatemala City | Daily |
| | 9.70 | Fort de Fracne, Martinique | | Daily |
| | 9.83 | IRF | Rome, Italy | Daily |
| | 9.86 | EAQ | Madrid, Spain | Daily |
| | 9.94 | JDY | Darien, Manchukuo | Daily |
| | 9.95 | CSW | Lisbon, Port. | Daily |
| | 10.22 | PSH | Rio de Janeiro, Brazil | ex.Su. |
| | 10.37 | EAJ-43 | Santa Cruz, Can. Is. | Daily |
| | 11.00 | PLP | Bandoeng, Java | Daily |
| | 11.04 | CSW | Lisbon, Port. | Daily |
| | 11.53 | SPD | Warsaw, Poland | Daily |
| | 11.70 | HP5A | Panama City | Daily |
| | 11.72 | TPA 4 | Paris, France | Daily |
| | 11.75 | GSD | London, Eng. | Daily |
| | 11.77 | DJD | Berlin, Ger. | Daily |
| | 11.80 | OER3 | Vienna, Ger. | Daily |
| | 11.80 | JZJ | Tokyo, Japan | Daily |
| | 11.81 | I 2RO 4 | Rome, Italy | Daily |
| | 11.84 | OLR4A | Prague, Czech | MTT&F |
| | 11.85 | DJP | Berlin, Germany | Daily |
| | 11.86 | GSE | London, Eng. | Daily |
| | 11.88 | TPB 7 | Paris, France | Daily |
| | 11.91 | CD1190 | Valdivia, Chile | Daily |
| S | 12.00 | RNE | Moscow, USSR | Daily |
| A | 13.63 | SPW | Warsaw, Pol. | ex.Sa. |
| | 15.11 | DJL | Berlin, Ger. | Daily |
| | 15.15 | YDC | Sourabaya, Java | Daily |
| | 15.18 | GSO | London, Eng. | Daily |
| | 15.20 | DJB | Berlin, Ger. | Daily |
| | 15.24 | TPA 2 | Paris, France | Daily |
| | 15.28 | DJQ | Berlin, Ger. | Daily |
| | 15.31 | GSP | London, Eng. | Daily |
| | 15.34 | DJR | Berlin, Ger. | Daily |
| S | 15.37 | HAS 3 | Budapest, Hung. | Sun. |
| | 17.77 | PHI | Huisen, Hol., | ex.Wed. |
| | 17.79 | GSG | London, Eng. | Daily |
| | 21.47 | GSH | London, Eng. | Daily |
| | 21.53 | GSJ | London, Eng. | Daily |

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Page Six

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AM-▲ PM-▼ Both-◆

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| E D S T | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 |
| Eastern (CD) | 12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| Central | 11 | 12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| Mountain | 10 | 11 | 12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Pacific | 9 | 10 | 11 | 12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |

| Meg. | Call | Place | |
|---|---|---|---|
| 4.11 | HCJB | Quito, Ecuador | ex.Mon. |
| 4.76 | HJ2ABJ | Santa Marta, Col. | ex.Su. |
| 4.78 | HJ1ABB | Barranquilla, Col. | ex.Su. |
| 4.80 | HJ1ABE | Cartagena, Col. | Daily |
| 4.82 | HJ7ABB | Bucaramanga, Col. | ex.Su |
| 4.84 | HJ3ABD | Bogota, Col. | Daily |
| 4.88 | HJ4ABP | Medellin.Col. | ex.Su. |
| C 4.90 | HJ3ABH | Bogota, Col. | Daily |
| 5.80 | YV5RC | Caracas, Venez. | Daily |
| 5.83 | TIGPH | SanJose, C.R. | ex.Su. |
| 5.85 | YV1RB | Maracaibo, Ven. | ex.Su. |
| 5.85 | HI1J | San Pedro, D.R. | Daily |
| 5.86 | YV 4RH | Valencia, Ven. | ex.Su. |
| 5.87 | HRN | Tegucigalpa, Hon. | Daily |
| 5.88 | HI9B | Santiago, D.R. | ex.Su. |
| 5.90 | T1LS | San Jose, R.D. | ex.Su. |
| 5.90 | YV3RA | Barquisimeto, Ven. | ex.Su. |
| 5.93 | HH2S | Port-au-Pr., Haiti | ex.Su. |
| 5.93 | YV1RL | Maracaibo, Ven. | ex.Su. |
| 5.94 | TG2X | Guatemala City | MWSa |
| 6.00 | HP5K | Colon, Panama | Daily |
| 6.01 | HJ3ABX | Bogota, Col. | Daily |
| 6.02 | DJC | Berlin, Ger. | Daily |
| 6.03 | HP5B | Panama City | Daily |
| 6.04 | HJ1ABG | Barranquilla, Col. | Daily |
| 6.05 | HJ6ABA | Pereira, Col. | ex.Su. |
| 6.05 | GSA | London, Eng. | Daily |
| 6.07 | OAX4Z | Lima, Peru | ex.Su. |
| 6.11 | HJ6ABB | Manizales, Col. | ex.Su. |
| 6.11 | GSL | London, Eng. | Daily |
| 6.15 | HJ4ABE | Medellin, Col. | Daily |
| 6.15 | H15N | Moca City R.D. | ex.Su. |
| 6.15 | YV5RD | Caracas, Ven. | Daily |
| 6.21 | TG2 | Guatemala City | ex.Su. |
| 6.22 | YV1RG | Valera, Venez. | Daily |
| 6.24 | HRD | LaCeiba, Honduras | ex Su. |
| 6.24 | HIN | Trujillo, R.D. | ex.Su. |
| 6.25 | YV5RJ | Caracas, Ven. | ex.Su. |
| 6.27 | YV5RP | Caracas, Ven. | ex.Su. |
| 6.29 | HIG | Trujillo City, R.D. | ex.Su. |
| 6.30 | YV4RD | Maracay, Venez | ex.Su. |
| 6.31 | HIZ | Trujillo, R.D. | ex.Su. |
| 6.34 | HI1X | Trujillo, R.D. | Tu.&Fr. |
| 6.36 | YV1RH | Maracaibo, Ven. | ex.Su. |
| 6.38 | YV5RF | Caracas, Ven. | ex.Su. |
| 6.40 | YV5RH | Caracas, Venez | ex.Su. |
| 6.40 | TGQA | Quezaltenango, Guat. | ex.Su. |
| 6.41 | TiPG | San Jose, C.R. | Daily |
| 6.42 | YV6RC | Bolivar, Venez. | ex.Su. |
| 6.47 | YV3RD | Barquismento, Ven. | Daily |
| 6.50 | HIL | Trujillo City, R.D. | ex.Su. |
| 6.52 | YV4RB | Valencia, Venez. | Daily |
| 6.55 | YV6RB | Bolivar, Venez. | ex.Su. |
| 6.63 | HIT | Trujillo, R.D. | ex.Su. |
| 6.63 | HC2RL | Guayaquil, Ec. | Su.&Tu. |
| 6.68 | TIEP | SanJose, C.R. | Daily |
| A 7.80 | HBP | Geneva, Switz. | Mon. |
| 7.89 | HC1RB | Quito, Ecuador | ex.Su. |
| S 9.12 | HAT-4 | Budapest Hung. | Su&W. |
| 9.23 | HC2CW | Guayaquil, Ecu. | ex.Su. |
| 9 34 | OAX4J | Lima, Peru | Daily |

## NOTES

| | | |
|---|---|---|
| 6.00 XEBT | Mexico City. | |
| 6.00 CFCX | Montreal, Que. | |
| 6.01 COCO | Havana, Cuba | |
| 6.02 XEUW | Vera Cruz, Mex. | |
| 6.04 W1XAL | Boston, Mass. | |
| 6.06 W8XAL | Cincinnati | |
| 6.06 W3XAU | Philadelphia | |
| 6.07 CFRX | Toronto, Ont. | |
| 6.08 W9XAA | Chicago | |
| 6.09 CRCX | Toronto, Ont. | |
| 6.10 W9XF | Chicago | |
| 6.10 W3XAL | Boundbr'k, N.J. | |
| 6.13 VE9HX | Halifax, N. S. | |
| 6.13 COCD | Havana, Cuba | |
| 6.14 W8XK | Pittsburgh | |
| 6.15 CJRO | Winnipeg, Man. | |
| 6.17 XEXA | Mexico City | |
| 6.28 COHB | Sancti-Spiritis, Cub | |
| 6.34 COCW | Havana, Cuba | |
| 7.38 XECR | Mexico City | |
| 8.66 COJK | Camaguey, Cuba | |
| 8.96 COKG | Santiago, Cuba | |
| 9.00 COBZ | Havana, Cuba. | |

Copy hour numbers from previous page ☛ 12 1 2 3 4 5 6 7 8 9

| Meg. | Call | Place | |
|---|---|---|---|
| 9.34 | HBL | Geneva, Switzerland | Mon. |
| 9.49 | EAR | Madrid, Spain | SuT&T |
| 9.50 | VK3ME | Melbourne, Aus. | ex.Su. |
| 9.51 | HJU | Buenaventura, Col. | MW&F |
| 9.51 | GSB | London, Eng. | Daily |
| 9.52 | HJ6ABH | Armenia, Col. | Daily |
| 9.52 | ZBW-3 | HongHong, China | Daily |
| 9.52 | OZF | Copenhagen, Den. | Daily |
| 9.53 | LKC | Oslo, Norway | Daily |
| 9.54 | DJN | Berlin, Ger. | Daily |
| 9.55 | OLR3A | Prague, Czech. | MTT&F |
| 9.56 | DJA | Berlin, Ger. | Daily |
| 9.57 | KZRM | Manila, P. I. | Daily |
| 9.58 | VLR | Melbourne, Aus. | ex Su. |
| 9.58 | GSC | London, Eng. | Daily |
| 9.59 | PCJ | Eindhoven, Holland | M&Tu. |
| 9.59 | VK2ME | Sydney, Aus. | Sun. |
| 9.60 | RAN | Moscow, USSR | Daily |
| 9.60 | HP5J | Panama City | Daily |
| 9.62 | HJ1ABP | Cartagena, Col. | Daily |
| 9.62 | ZRK | Johannesburg, S.Af. | ex.Sa. |
| 9.63 | HJ7ABD | Bucaramanga, Col. | Daily |
| 9.63 | I 2RO3 | Rome, Italy | Daily |
| 9.64 | HH3W | Port-au-Pr., Haiti | ex.Su. |
| 9.65 | CS2WA | Lisbon, Port. | T,T&Sa. |
| 9.66 | LRX | BuenosAires, Arg. | Daily |
| 9.67 | T14-NRH | Heredia, CR. | TuTh&Sa |
| 9.68 | TGWA | Guatemala City | Daily |
| 9.70 | | Fort de Fracne, Martinique | Daily |
| 9.83 | IRF | Rome, Italy | Daily |
| 9.86 | EAQ | Madrid, Spain | Daily |
| 9.94 | JDY | Darien, Manchukuo | Daily |
| 9.95 | CSW | Lisbon, Port. | Daily |
| 10.22 | PSH | Rio de Janeiro, Brazil | ex.Su. |
| 10.37 | EAJ-43 | Santa Cruz, Can. Is. | Daily |
| 11.00 | PLP | Bandoeng, Java | Daily |
| 11.04 | CSW | Lisbon, Port. | Daily |
| 11.53 | SPD | Warsaw, Poland | Daily |
| 11.70 | HP5A | Panama City | Daily |
| 11.72 | TPA 4 | Paris, France | Daily |
| 11.75 | GSD | London, Eng. | Daily |
| 11.77 | DJD | Berlin, Ger. | Daily |
| 11.80 | OER3 | Vienna, Ger. | Daily |
| 11.80 | JZJ | Tokyo, Japan | Daily |
| 11.81 | I 2RO 4 | Rome, Italy | Daily |
| 11.84 | OLR4A | Prague, Czech | MTT&F |
| 11.85 | DJP | Berlin, Germany | Daily |
| 11.86 | GSE | London, Eng. | Daily |
| 11.88 | TPB 7 | Paris, France | Daily |
| 11.91 | CD1190 | Valdivia, Chile | Daily |
| S 12.00 | RNE | Moscow, USSR | Daily |
| A 13.63 | SPW | Warsaw, Pol. | ex.Sa. |
| 15.11 | DJL | Berlin, Ger. | Daily |
| 15.15 | YDC | Sourabaya, Java | Daily |
| 15.18 | GSO | London, Eng. | Daily |
| 15.20 | DJB | Berlin, Ger. | Daily |
| 15.24 | TPA 2 | Paris, France | Daily |
| 15.28 | DJQ | Berlin, Ger. | Daily |
| 15.31 | GSP | London, Eng. | Daily |
| 15.34 | DJR | Berlin, Ger. | Daily |
| S 15.37 | HAS 3 | Budapest, Hung. | Sun. |
| 17.77 | PHI | Huisen, Hol., | ex.Wed. |
| 17.79 | GSG | London, Eng. | Daily |
| 21.47 | GSH | London, Eng. | Daily |
| 21.53 | GSJ | London, Eng. | Daily |

Canada, Cuba, Mexico and the U.S. have reached an agreement, which, when of practically all stations between 540 and 1600 Kilocycles. Subscribers to Hayn will not be inconvenienced by the changes, for they will have new logs in ad cents from Haynes' Radio Log, 161 W. Harrison St., Chicago.

Rule out FOUR rows of hour figures, leaving only those for YOUR Time Zone. Then, you'll know when to tune for desired stations. Conversely, by comparing your dial number with data herein, you can often identify those heard by chance. Megacycle numbers are purposely irregular in appearance, with three, two, one or no digits darker to denote the degree of signal strength experienced by the majority of listeners in America. "Local" Stations, which operate almost continuously are listed at the extreme right. "A", "S", and "C" at the left indicate spots used by Amateurs, Ships and AirCraft.

AM-▲ PM-▼ Both-◆

| E D S T | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Eastern (CD) | 12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| Central | 11 | 12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| Mountain | 10 | 11 | 12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Pacific | 9 | 10 | 11 | 12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |

| Meg. | Call | Place | |
|---|---|---|---|
| 4.11 | HCJB | Quito, Ecuador | ex.Mon. |
| 4.76 | HJ2ABJ | Santa Marta, Col. | ex.Su. |
| 4.78 | HJ1ABB | Barranquilla, Col. | ex.Su. |
| 4.80 | HJ1ABE | Cartagena, Col. | Daily |
| 4.82 | HJ7ABB | Bucaramanga, Col. | ex.Su |
| 4.84 | HJ3ABD | Bogota, Col. | Daily |
| 4.88 | HJ4ABP | Medellin. Col. | ex.Su. |
| C4.90 | HJ3ABH | Bogota, Col. | Daily |
| 5.80 | YV5RC | Caracas, Venez. | Daily |
| 5.83 | TIGPH | SanJose, C.R. | ex.Su. |
| 5.85 | YV1RB | Maracaibo, Ven. | ex.Su. |
| 5.85 | HI1J | San Pedro, D.R. | Daily |
| 5.86 | YV4RH | Valencia, Ven. | ex.Su. |
| 5.87 | HRN | Tegucigalpa, Hon. | Daily |
| 5.88 | HI9B | Santiago, D.R. | ex.Su. |
| 5.90 | T1LS | San Jose, R.D. | ex.Su. |
| 5.90 | YV3RA | Barquisimeto, Ven. | ex.Su. |
| 5.93 | HH2S | Port-au-Pr., Haiti | ex.Su. |
| 5.93 | YV1RL | Maracaibo, Ven. | ex.Su. |
| 5.94 | TG2X | Guatemala City | MWSa |
| 6.00 | HP5K | Colon, Panama | Daily |
| 6.01 | HJ3ABX | Bogota, Col. | Daily |
| 6.02 | DJC | Berlin, Ger. | Daily |
| 6.03 | HP5B | Panama City | Daily |
| 6.04 | HJ1ABG | Barranquilla, Col. | Daily |
| 6.05 | HJ6ABA | Pereira, Col. | ex.Su. |
| 6.05 | GSA | London, Eng. | Daily |
| 6.07 | OAX4Z | Lima, Peru | ex.Su. |
| 6.11 | HJ6ABB | Manizales, Col. | ex.Su. |
| 6.11 | GSL | London, Eng. | Daily |
| 6.15 | HJ4ABE | Medellin, Col. | Daily |
| 6.15 | HI5N | Moca City R.D. | ex.Su. |
| 6.15 | YV5RD | Caracas, Ven. | Daily |
| 6.21 | TG2 | Guatemala City | ex.Su. |
| 6.22 | YV1RG | Valera, Venez. | Daily |
| 6.24 | HRD | LaCeiba, Honduras | ex Su. |
| 6.24 | HIN | Trujillo, R.D. | ex.Su. |
| 6.25 | YV5RJ | Caracas, Ven. | ex.Su. |
| 6.27 | YV5RP | Caracas, Ven. | ex.Su. |
| 6.29 | HIG | Trujillo City, R.D. | ex.Su. |
| 6.30 | YV4RD | Maracay, Venez | ex.Su. |
| 6.31 | HIZ | Trujillo, R.D. | ex.Su. |
| 6.34 | HI1K | [illegible] | Tu&Fr |
| 6.36 | [illegible] | [illegible] | ex.Su. |
| 6.38 | YV5RT | Caracas, Ven. | ex.Su. |
| 6.40 | YV5RH | Caracas, Venez | ex.Su. |
| 6.40 | TGQA | Quezaltenango, Guat. | ex.Su. |
| 6.41 | TIPG | San Jose, C.R. | Daily |
| 6.42 | YV6RC | Bolivar, Venez. | ex.Su. |
| 6.47 | YV3RD | Barquismento, Ven. | Daily |
| 6.50 | HIL | Trujillo City, R.D. | ex.Su. |
| 6.52 | YV4RB | Valencia, Venez | Daily |
| 6.55 | YV6RB | Bolivar, Venez. | ex.Su. |
| 6.63 | HIT | Trujillo, R.D. | ex.Su. |
| 6.63 | HC2RL | Guayaquil, Ec. | Su.&Tu. |
| 6.68 | TIEP | SanJose, C.R. | Daily |
| A7.80 | HBP | Geneva, Switz. | Mon. |
| 7.89 | HC1RB | Quito, Ecuador | ex.Su. |
| S9.12 | HAT 4 | Budapest, Hung. | Su&W. |
| 9.23 | HC2CW | Guayaquil Ecu. | ex Su. |
| 9.34 | OAX4J | Lima, Peru | Daily |

NOTES

| | | |
|---|---|---|
| 6.00 | XEBT | Mexico City. |
| 6.00 | CFCX | Montreal, Que. |
| 6.01 | COCO | Havana, Cuba |
| 6.02 | XEUW | Vera Cruz, Mex. |
| 6.04 | W1XAL | Boston, Mass. |
| 6.06 | W8XAL | Cincinnati |
| 6.06 | W3XAU | Philadelphia |
| 6.07 | CFRX | Toronto, Ont. |
| 6.08 | W9XAA | Chicago |
| 6.09 | CRCX | Toronto, Ont. |
| 6.10 | W9XF | Chicago |
| 6.10 | W3XAL | Boundbr'k, N.J. |
| 6.13 | VE9HX | Halifax, N. S. |
| 6.13 | COCD | Havana, Cuba |
| 6.14 | W8XK | Pittsburgh |
| 6.15 | CJRO | Winnipeg, Man. |
| 6.17 | XEXA | Mexico City |
| 6.28 | COHB | Sancti-Spiritis, Cub |
| 6.34 | COCW | Havana, Cuba |
| 7.38 | XECR | Mexico City |
| 8.66 | COJK | Camaguey, Cuba |
| 8.96 | COKG | Santiago, Cuba |
| 9.00 | COBZ | Havana, Cuba |

Copy hour numbers from previous page

12 1 2 3 4 5 6 7 8 9

| | | | |
|---|---|---|---|
| 9.34 | HBL | Geneva, Switzerland | Mon. |
| 9.49 | EAR | Madrid, Spain | SuT&T |
| 9.50 | VK3ME | Melbourne, Aus. | ex.Su. |
| 9.51 | HJU | Buenaventura, Col. | MW&F |
| 9.51 | GSB | London, Eng. | Daily |
| 9.52 | HJ6ABH | Armenia, Col. | Daily |
| 9.52 | ZBW-3 | HongHong, China | Daily |
| 9.52 | OZF | Copenhagen, Den. | Daily |
| 9.53 | LKC | Oslo, Norway | Daily |
| 9.54 | DJN | Berlin, Ger. | Daily |
| 9.55 | OLR3A | Prague, Czech. | MTT&F |
| 9.56 | DJA | Berlin, Ger. | Daily |
| 9.57 | KZRM | Manila, P. I. | Daily |
| 9.58 | VLR | Melbourne, Aus. | ex Su. |
| 9.58 | GSC | London, Eng. | Daily |
| 9.59 | PCJ | Eindhoven, Holland | M&Tu. |
| 9.59 | VK2ME | Sydney, Aus. | Sun. |
| 9.60 | RAN | Moscow, USSR | Daily |
| 9.60 | HP5J | Panama City | Daily |
| 9.62 | HJ1ABP | Cartagena, Col. | Daily |
| 9.62 | ZRK | Johannesburg, S.Af. | ex.Sa. |
| 9.63 | HJ7ABD | Bucaramanga, Col. | Daily |
| 9.63 | I 2RO3 | Rome, Italy | Daily |
| 9.64 | HH3W | Port-au-Pr., Haiti | ex.Su. |
| 9.65 | CS2WA | Lisbon, Port. | T, T&Sa. |
| 9.66 | LRX | BuenosAires, Arg. | Daily |
| 9.67 | T14-NRH | Heredia, CR. | TuTh&Sa |
| 9.68 | TGWA | Guatemala City | Daily |
| 9.70 | | Fort de Fracne, Martinique | Daily |
| 9.83 | IRF | Rome, Italy | Daily |
| 9.86 | EAQ | Madrid, Spain | Daily |
| 9.94 | JDY | Darien, Manchukuo | Daily |
| 9.95 | CSW | Lisbon, Port. | Daily |
| 10.22 | PSH | Rio de Janeiro, Brazil | ex.Su. |
| 10.37 | EAJ-43 | Santa Cruz, Can. Is. | Daily |
| 11.00 | PLP | Bandoeng, Java | Daily |
| 11.04 | CSW | Lisbon, Port. | Daily |
| 11.53 | SPD | Warsaw, Poland | Daily |
| 11.70 | HP5A | Panama City | Daily |
| 11.72 | TPA 4 | Paris, France | Daily |
| 11.75 | GSD | London, Eng. | Daily |
| 11.77 | DJD | Berlin, Ger. | Daily |
| 11.80 | OER3 | Vienna, Ger. | Daily |
| 11.80 | JZJ | Tokyo, Japan | Daily |
| 11.81 | I 2RO 4 | Rome, Italy | Daily |
| 11.84 | OLR4A | Prague, Czech | MTT&F |
| 11.85 | DJP | Berlin, Germany | Daily |
| 11.86 | GSE | London, Eng. | Daily |
| 11.88 | TPB 7 | Paris, France | Daily |
| 11.91 | CD1190 | Valdivia, Chile | Daily |
| S12.00 | RNE | Moscow, USSR | Daily |
| A13.63 | SPW | Warsaw Pol. | [illegible] |
| 15.11 | DJL | Berlin, Ger. | Daily |
| 15.15 | YDC | Sourabaya, Java | Daily |
| 15.18 | GSO | London, Eng. | Daily |
| 15.20 | DJB | Berlin, Ger. | Daily |
| 15.24 | TPA 2 | Paris, France | Daily |
| 15.28 | DJQ | Berlin, Ger. | Daily |
| 15.31 | GSP | London, Eng. | Daily |
| 15.34 | DJR | Berlin, Ger. | Daily |
| S15.37 | HAS 3 | Budapest, Hung. | Sun. |
| 17.77 | PHI | Huisen, Hol., | ex.Wed. |
| 17.79 | GSG | London, Eng. | Daily |
| 21.47 | GSH | London, Eng. | Daily |
| 21.53 | GSJ | London. Eng. | Daily |

Canada, Cuba, Mexico and the U.S. have reached an agreement, which, when
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AM-▲ PM-▼ Both-◆

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| E D S T | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 |
| Eastern(CD) | 12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| Central | 11 | 12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| Mountain | 10 | 11 | 12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Pacific | 9 | 10 | 11 | 12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |

| | Meg. | Call | Place | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 4.11 | HCJB | Quito, Ecuador | ex.Mon. | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — | — |
| | 4.76 | HJ2ABJ | Santa Marta,Col. | ex.Su. | — | — | — | — | — | —▼ | ▼▼ | ▼▼ | ▼▼ | ▼— | — | — |
| | 4.78 | HJ1ABB | Barranquilla, Col. | ex.Su. | — | — | — | — | —▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — |
| | 4.80 | HJ1ABE | Cartagena, Col. | Daily | — | — | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼— | — |
| | 4.82 | HJ7ABB | Bucaramanga,Col. | ex.Su | — | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — |
| | 4.84 | HJ3ABD | Bogota, Col. | Daily | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼— |
| | 4.88 | HJ4ABP | Medellin.Col. | ex.Su. | — | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — |
| C | 4.90 | HJ3ABH | Bogota, Col. | Daily | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — |
| | 5.80 | YV5RC | Caracas,Venez. | Daily | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼— | — |
| | 5.83 | TIGPH | SanJose,C.R. | ex.Su. | — | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — |
| | 5.85 | YV1RB | Maracaibo,Ven. | ex.Su. | — | — | — | — | —▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼— | — | — |
| | 5.85 | HI1J | San Pedro, D.R. | Daily | — | — | — | — | — | — | —▼ | ▼▼ | ▼▼ | — | — | — |
| | 5.86 | YV 4RH | Valencia,Ven. | ex.Su. | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — |
| | 5.87 | HRN | Tegucigalpa,Hon. | Daily | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼— | — | — |
| | 5.88 | HI9B | Santiago, D.R. | ex.Su. | — | — | — | — | —▼ | ▼▼ | ▼▼ | ▼— | — | — | — | — |
| | 5.90 | T1LS | San Jose, R.D. | ex.Su. | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — |
| | 5.90 | YV3RA | Barquisimeto,Ven. | ex.Su. | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — | — | — |
| | 5.93 | HH2S | Port-au-Pr., Haiti | ex.Su. | — | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | — | — |
| | 5.93 | YV1RL | Maracaibo, Ven. | ex.Su. | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼— | — | — |
| | 5.94 | TG2X | Guatemala City | MWSa | — | — | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ |
| | 6.00 | HP5K | Colon, Panama | Daily | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — |
| | 6.01 | HJ3ABX | Bogota, Col. | Daily | — | — | — | — | — | —▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — |
| | 6.02 | DJC | Berlin, Ger. | Daily | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼— | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | —▲ |
| | 6.03 | HP5B | Panama City | Daily | — | — | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼— | — |
| | 6.04 | HJ1ABG | Barranquilla,Col. | Daily | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▲▲ |
| | 6.05 | HJ6ABA | Pereira, Col. | ex.Su. | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼— | — |
| | 6.05 | GSA | London, Eng. | Daily | — | — | — | — | ▼▼ | ▼▼ | — | — | — | — | — | — |
| | 6.07 | OAX4Z | Lima, Peru | ex.Su. | — | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼— |
| | 6.11 | HJ6ABB | Manizales,Col. | ex.Su. | — | — | — | — | — | — | — | — | ▼▼ | ▼▼ | — | — |
| | 6.11 | GSL | London, Eng. | Daily | — | — | — | — | — | — | —▼ | ▼▼ | ▼— | —▼ | ▼▼ | ▼— |
| | 6.15 | HJ4ABE | Medellin,Col. | Daily | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼— | — |
| | 6.15 | H15N | Moca City R.D. | ex.Su. | — | — | — | — | — | —▼ | ▼▼ | ▼— | — | — | — | — |
| | 6.15 | YV5RD | Caracas,Ven. | Daily | — | — | — | — | —▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — | — |
| | 6.21 | TG2 | Guatemala City | ex.Su. | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — |
| | 6.22 | YV1RG | Valera, Venez. | Daily | — | — | — | — | — | —▼ | ▼▼ | ▼▼ | ▼— | — | — | — |
| | 6.24 | HRD | LaCeiba, Honduras | ex Su. | — | — | — | — | — | — | — | —▼ | ▼▼ | ▼▼ | ▼— | — |
| | 6.24 | HIN | Trujillo, R.D. | ex.Su. | — | — | — | — | — | — | —▼ | ▼▼ | ▼▼ | ▼— | — | — |
| | 6.25 | YV5RJ | Caracas, Ven. | ex.Su. | — | — | — | — | — | —▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼— | — |
| | 6.27 | YV5RP | Caracas,Ven. | ex.Su. | — | — | — | — | — | — | —▼ | ▼▼ | ▼▼ | ▼▼ | ▼— | — |
| | 6.29 | HIG | Trujillo City, R.D. | ex.Su. | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼— | — |
| | 6.30 | YV4RD | Maracay, Venez | ex.Su. | — | — | — | — | — | — | —▼ | ▼▼ | ▼▼ | ▼— | — | — |
| | 6.31 | HIZ | Trujillo, R.D. | ex.Su. | ▼▼ | ▼▼ | ▼▼ | — | — | — | — | — | — | — | — | —▲ |
| | 6.34 | HI1X | Trujillo, R.D. | Tu.&Fr. | — | — | — | — | — | — | — | — | ▼▼ | ▼▼ | — | — |
| | 6.36 | YV1RH | Maracaibo,Ven. | ex.Su. | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — |
| | 6.38 | YV5RF | Caracas, Ven. | ex.Su. | — | — | — | — | — | — | —▼ | ▼▼ | ▼▼ | ▼▼ | ▼— | — |
| | 6.40 | YV5RH | Caracas, Venez | ex.Su. | — | — | — | — | —▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼— | — |
| | 6.40 | TGQA | Quezaltenango,Guat. | ex.Su. | — | — | — | — | — | — | — | — | — | ▼▼ | ▼▼ | — |
| | 6.41 | TiPG | San Jose, C.R. | Daily | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼— |
| | 6.42 | YV6RC | Bolivar, Venez. | ex.Su. | — | — | — | — | — | —▼ | ▼▼ | ▼▼ | ▼▼ | ▼— | — | — |
| | 6.47 | YV3RD | Barquismento,Ven. | Daily | — | — | — | — | — | —▼ | ▼▼ | ▼▼ | ▼▼ | ▼— | — | — |
| | 6.50 | HIL | Trujillo City, R.D. | ex.Su. | — | — | — | — | — | —▼ | ▼▼ | ▼▼ | ▼— | — | — | — |
| | 6.52 | YV4RB | Valencia,Venez. | Daily | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼— | — | — | — |
| | 6.55 | YV6RB | Bolivar, Venez. | ex.Su. | — | — | — | — | — | —▼ | ▼▼ | ▼▼ | ▼▼ | ▼— | — | — |
| | 6.63 | HIT | Trujillo, R.D. | ex.Su. | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼— | — | — | — |
| | 6.63 | HC2RL | Guayaquil,Ec. | Su.&Tu. | — | — | — | — | — | —▼ | ▼▼ | ▼— | — | ▼▼ | ▼▼ | — |
| A | 6.68 | TIEP | SanJose,C.R. | Daily | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼— |
| | 7.80 | HBP | Geneva,Switz. | Mon. | — | — | — | — | — | — | —▼ | ▼▼ | — | — | — | — |
| S | 7.89 | HC1RB | Quito, Ecuador | ex.Su. | — | — | — | — | — | — | — | — | — | ▼▼ | ▼▼ | — |
| | 9.12 | HAT-4 | Budapest,Hung. | Su&W. | — | — | — | — | — | — | — | ▼▼ | — | — | — | — |
| | 9.23 | HC2CW | Guayaquil,Ecu. | ex.Su. | — | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — |
| | 9 34 | OAX4J | Lima, Peru | Daily | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ |

NOTES

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| 6.00 | XEBT | Mexico City. |
| 6.00 | CFCX | Montreal, Que. |
| 6.01 | COCO | Havana,Cuba |
| 6.02 | XEUW | Vera Cruz, Mex. |
| 6.04 | W1XAL | Boston, Mass. |
| 6.06 | W8XAL | Cincinnati |
| 6.06 | W3XAU | Philadelphia |
| 6.07 | CFRX | Toronto, Ont. |
| 6.08 | W9XAA | Chicago |
| 6.09 | CRCX | Toronto,Ont. |
| 6.10 | W9XF | Chicago |
| 6.10 | W3XAL | Boundbr'k, N.J. |
| 6.13 | VE9HX | Halifax, N. S. |
| 6.13 | COCD | Havana, Cuba |
| 6.14 | W8XK | Pittsburgh |
| 6.15 | CJRO | Winnipeg,Man. |
| 6.17 | XEXA | Mexico City |
| 6.28 | COHB | Sancti-Spiritis,Cub |
| 6.34 | COCW | Havana, Cuba |
| 7.38 | XECR | Mexico City |
| 8.66 | COJK | Camaguey, Cuba |
| 8.96 | COKG | Santiago, Cuba |
| 9.00 | COBZ | Havana, Cuba. |

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101

Rule out FOUR rows of hour figures, leaving only those for YOUR Time Zone. Then, you'll know when to tune for desired stations. Conversely, by comparing your dial number with data herein, you can often identify those heard by chance. Megacycle numbers are purposely irregular in appearance, with three, two, one or no digits darker to denote the degree of signal strength experienced by the majority of listeners in America. "Local" Stations, which operate almost continuously are listed at the extreme right. "A", "S", and "C" at the left indicate spots used by Amateurs, Ships and AirCraft.

AM-▲ PM-▼ Both-◆

| EDST | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Eastern(CD) | 12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| Central | 11 | 12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| Mountain | 10 | 11 | 12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Pacific | 9 | 10 | 11 | 12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |

|  | Meg. | Call | Place |  |  |  |  |  |  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  | 4.11 | HCJB | Quito, Ecuador ex.Mon. | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — | — |
|  | 4.76 | HJ2ABJ | Santa Marta,Col. ex.Su. | — | — | — | — | — | –▼ | ▼▼ | ▼▼ | ▼▼ | ▼– | — | — |
|  | 4.78 | HJ1ABB | Barranquilla,Col. ex.Su. | — | — | — | — | –▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — |
|  | 4.80 | HJ1ABE | Cartagena, Col. Daily | — | — | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼– | — |
|  | 4.82 | HJ7ABB | Bucaramanga,Col.ex.Su | — | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — |
|  | 4.84 | HJ3ABD | Bogota, Col. Daily | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼– |
|  | 4.88 | HJ4ABP | Medellin.Col. ex.Su. | — | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — |
| C | 4.90 | HJ3ABH | Bogota, Col. Daily | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — |
|  | 5.80 | YV5RC | Caracas,Venez. Daily | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼– | — |
|  | 5.83 | TIGPH | SanJose,C.R. ex.Su. | — | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — |
|  | 5.85 | YV1RB | Maracaibo,Ven. ex.Su. | — | — | — | — | –▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼– | — | — |
|  | 5.85 | HI1J | San Pedro, D.R. Daily | — | — | — | — | — | — | –▼ | ▼▼ | ▼▼ | — | — | — |
|  | 5.86 | YV4RH | Valencia,Ven. ex.Su. | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — |
|  | 5.87 | HRN | Tegucigalpa,Hon. Daily | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼– | — | — |
|  | 5.88 | HI9B | Santiago, D.R. ex.Su. | — | — | — | — | –▼ | ▼▼ | ▼▼ | ▼– | — | — | — | — |
|  | 5.90 | T1LS | San Jose, R.D. ex.Su. | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — |
|  | 5.90 | YV3RA | Barquisimeto,Ven. ex.Su. | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — | — | — |
|  | 5.93 | HH2S | Port-au-Pr., Haiti ex.Su. | — | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | — | — |
|  | 5.93 | YV1RL | Maracaibo, Ven. ex.Su. | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼– | — | — |
|  | 5.94 | TG2X | Guatemala City MWSa | — | — | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ |
|  | 6.00 | HP5K | Colon, Panama Daily | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — |
|  | 6.01 | HJ3ABX | Bogota, Col. Daily | — | — | — | — | — | –▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — |
|  | 6.02 | DJC | Berlin, Ger. Daily | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼– | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | –▲ |
|  | 6.03 | HP5B | Panama City Daily | — | — | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼– | — |
|  | 6.04 | HJ1ABG | Barranquilla,Col. Daily | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▲▲ |
|  | 6.05 | HJ6ABA | Pereira, Col. ex.Su. | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼– | — |
|  | 6.05 | GSA | London, Eng. Daily | — | — | — | — | ▼▼ | ▼▼ | — | — | — | — | — | — |
|  | 6.07 | OAX4Z | Lima, Peru ex.Su. | — | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼– |
|  | 6.11 | HJ6ABB | Manizales,Col. ex.Su. | — | — | — | — | — | — | — | — | ▼▼ | ▼▼ | — | — |
|  | 6.11 | GSL | London, Eng. Daily | — | — | — | — | — | — | –▼ | ▼▼ | ▼– | –▼ | ▼▼ | ▼– |
|  | 6.15 | HJ4ABE | Medellin,Col. Daily | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼– | — |
|  | 6.15 | HI5N | Moca City R.D. ex.Su. | — | — | — | — | — | –▼ | ▼▼ | ▼– | — | — | — | — |
|  | 6.15 | YV5RD | Caracas,Ven. Daily | — | — | — | — | –▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — | — |
|  | 6.21 | TG2 | Guatemala City ex.Su. | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — |
|  | 6.22 | YV1RG | Valera, Venez. Daily | — | — | — | — | — | –▼ | ▼▼ | ▼▼ | ▼– | — | — | — |
|  | 6.24 | HRD | LaCeiba, Honduras ex Su. | — | — | — | — | — | — | — | –▼ | ▼▼ | ▼▼ | ▼– | — |
|  | 6.24 | HIN | Trujillo, R.D. ex.Su. | — | — | — | — | — | — | –▼ | ▼▼ | ▼▼ | ▼– | — | — |
|  | 6.25 | YV5RJ | Caracas, Ven. ex.Su. | — | — | — | — | — | –▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼– | — |
|  | 6.27 | YV5RP | Caracas,Ven. ex.Su. | — | — | — | — | — | — | –▼ | ▼▼ | ▼▼ | ▼▼ | ▼– | — |
|  | 6.29 | HIG | Trujillo City, R.D. ex.Su. | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼– | — |
|  | 6.30 | YV4RD | Maracay, Venez ex.Su. | — | — | — | — | — | — | –▼ | ▼▼ | ▼▼ | ▼– | — | — |
|  | 6.31 | HIZ | Trujillo, R.D. ex.Su. | ▼▼ | ▼▼ | ▼▼ | — | — | — | — | — | — | — | — | –▲ |
|  | 6.34 | HI1X | Trujillo, R.D. Tu.&Fr. | — | — | — | — | — | — | — | — | ▼▼ | ▼▼ | — | — |
|  | 6.36 | YV1RH | Maracaibo,Ven. ex.Su. | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — |
|  | 6.38 | YV5RF | Caracas, Ven. ex.Su. | — | — | — | — | — | — | –▼ | ▼▼ | ▼▼ | ▼▼ | ▼– | — |
|  | 6.40 | YV5RH | Caracas, Venez ex.Su. | — | — | — | — | –▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼– | — |
|  | 6.40 | TGQA | Quezaltenango,Guat.ex.Su. | — | — | — | — | — | — | — | — | — | ▼▼ | ▼▼ | — |
|  | 6.41 | TiPG | San Jose, C.R. Daily | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼– |
|  | 6.42 | YV6RC | Bolivar, Venez. ex.Su. | — | — | — | — | — | –▼ | ▼▼ | ▼▼ | ▼▼ | ▼– | — | — |
|  | 6.47 | YV3RD | Barquismento,Ven.Daily | — | — | — | — | — | –▼ | ▼▼ | ▼▼ | ▼▼ | ▼– | — | — |
|  | 6.50 | HIL | Trujillo City, R.D.ex.Su. | — | — | — | — | — | –▼ | ▼▼ | ▼▼ | ▼– | — | — | — |
|  | 6.52 | YV4RB | Valencia,Venez. Daily | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼– | — | — | — |
|  | 6.55 | YV6RB | Bolivar, Venez. ex.Su. | — | — | — | — | — | –▼ | ▼▼ | ▼▼ | ▼▼ | ▼– | — | — |
|  | 6.63 | HIT | Trujillo, R.D. ex.Su. | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼– | — | — | — |
|  | 6.63 | HC2RL | Guayaquil,Ec. Su.&Tu. | — | — | — | — | — | –▼ | ▼▼ | ▼– | — | ▼▼ | ▼▼ | — |
| A | 6.68 | TIEP | SanJose,C.R. Daily | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼– |
|  | 7.80 | HBP | Geneva,Switz. Mon. | — | — | — | — | — | — | –▼ | ▼▼ | — | — | — | — |
| S | 7.89 | HC1RB | Quito, Ecuador ex.Su. | — | — | — | — | — | — | — | — | — | ▼▼ | ▼▼ | — |
|  | 9.12 | HAT-4 | Budapest,Hung.Su&W. | — | — | — | — | — | — | — | ▼▼ | — | — | — | — |
|  | 9.23 | HC2CW | Guayaquil,Ecu. ex.Su. | — | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — |
|  | 9 34 | OAX4J | Lima, Peru Daily | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ |

## NOTES

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| 6.00 | XEBT | Mexico City. |
| 6.00 | CFCX | Montreal, Que. |
| 6.01 | COCO | Havana,Cuba |
| 6.02 | XEUW | Vera Cruz, Mex. |
| 6.04 | W1XAL | Boston, Mass. |
| 6.06 | W8XAL | Cincinnati |
| 6.06 | W3XAU | Philadelphia |
| 6.07 | CFRX | Toronto, Ont. |
| 6.08 | W9XAA | Chicago |
| 6.09 | CRCX | Toronto,Ont. |
| 6.10 | W9XF | Chicago |
| 6.10 | W3XAL | Boundbr'k, N.J. |
| 6.13 | VE9HX | Halifax, N. S. |
| 6.13 | COCD | Havana, Cuba |
| 6.14 | W8XK | Pittsburgh |
| 6.15 | CJRO | Winnipeg,Man. |
| 6.17 | XEXA | Mexico City |
| 6.28 | COHB | Sancti-Spiritis,Cub |
| 6.34 | COCW | Havana, Cuba |
| 7.38 | XECR | Mexico City |
| 8.66 | COJK | Camaguey, Cuba |
| 8.96 | COKG | Santiago, Cuba |
| 9.00 | COBZ | Havana, Cuba. |

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AM-▲ PM-▼ Both-◆

EDST 1 2 3 4 5 6 7 8 9 10 11 12 1
Eastern(CD) 12 1 2 3 4 5 6 7 8 9 10 11 12
Central 11 12 1 2 3 4 5 6 7 8 9 10 11
Mountain 10 11 12 1 2 3 4 5 6 7 8 9 10
Pacific 9 10 11 12 1 2 3 4 5 6 7 8 9

| Meg. | Call | Place | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | NOTES |
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| 4.11 | HCJB | Quito, Ecuador | ex.Mon. | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — | — | |
| 4.76 | HJ2ABJ | Santa Marta,Col. | ex.Su. | — | — | — | — | — | –▼ | ▼▼ | ▼▼ | ▼▼ | ▼– | — | — | |
| 4.78 | HJ1ABB | Barranquilla, Col. | ex.Su. | — | — | — | — | –▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — | |
| 4.80 | HJ1ABE | Cartagena, Col. | Daily | — | — | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼– | — | |
| 4.82 | HJ7ABB | Bucaramanga,Col. | ex.Su | — | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — | |
| 4.84 | HJ3ABD | Bogota, Col. | Daily | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼– | |
| 4.88 | HJ4ABP | Medellin.Col. | ex.Su. | — | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — | |
| 4.90 | HJ3ABH | Bogota, Col. | Daily | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — | |
| C | | | | | | | | | | | | | | | | |
| 5.80 | YV5RC | Caracas,Venez. | Daily | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼– | — | |
| 5.83 | TIGPH | SanJose,C.R. | ex.Su. | — | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — | |
| 5.85 | YV1RB | Maracaibo,Ven. | ex.Su. | — | — | — | — | –▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼– | — | — | |
| 5.85 | HI1J | San Pedro, D.R. | Daily | — | — | — | — | — | — | –▼ | ▼▼ | ▼▼ | — | — | — | |
| 5.86 | YV 4RH | Valencia,Ven. | ex.Su. | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — | |
| 5.87 | HRN | Tegucigalpa,Hon. | Daily | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼– | — | — | |
| 5.88 | HI9B | Santiago, D.R. | ex.Su. | — | — | — | — | –▼ | ▼▼ | ▼▼ | ▼– | — | — | — | — | |
| 5.90 | T1LS | San Jose, R.D. | ex.Su. | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — | |
| 5.90 | YV3RA | Barquisimeto,Ven. | ex.Su. | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — | — | — | |
| 5.93 | HH2S | Port-au-Pr., Haiti | ex.Su. | — | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | — | — | |
| 5.93 | YV1RL | Maracaibo, Ven. | ex.Su. | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼– | — | — | |
| 5.94 | TG2X | Guatemala City | MWSa | — | — | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | |
| 6.00 | HP5K | Colon, Panama | Daily | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — | 6.00 XEBT Mexico City. |
| 6.01 | HJ3ABX | Bogota, Col. | Daily | — | — | — | — | — | –▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — | 6.00 CFCX Montreal, Que. |
| 6.02 | DJC | Berlin, Ger. | Daily | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼– | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | –▲ | 6.01 COCO Havana,Cuba |
| 6.03 | HP5B | Panama City | Daily | — | — | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼– | — | 6.02 XEUW Vera Cruz, Mex. |
| 6.04 | HJ1ABG | Barranquilla,Col. | Daily | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▲▲ | 6.04 W1XAL Boston, Mass. |
| 6.05 | HJ6ABA | Pereira, Col. | ex.Su. | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼– | — | |
| 6.05 | GSA | London, Eng. | Daily | — | — | — | — | ▼▼ | ▼▼ | — | — | — | — | — | — | 6.06 W8XAL Cincinnati |
| 6.07 | OAX4Z | Lima, Peru | ex.Su. | — | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼– | 6.06 W3XAU Philadelphia |
| 6.11 | HJ6ABB | Manizales,Col. | ex.Su. | — | — | — | — | — | — | — | — | ▼▼ | ▼▼ | — | — | 6.07 CFRX Toronto, Ont. |
| 6.11 | GSL | London, Eng. | Daily | — | — | — | — | — | — | –▼ | ▼▼ | ▼– | –▼ | ▼▼ | ▼– | 6.08 W9XAA Chicago |
| 6.15 | HJ4ABE | Medellin,Col. | Daily | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼– | — | 6.09 CRCX Toronto,Ont. |
| 6.15 | H15N | Moca City R.D. | ex.Su. | — | — | — | — | — | –▼ | ▼▼ | ▼– | — | — | — | — | 6.10 W9XF Chicago |
| 6.15 | YV5RD | Caracas,Ven. | Daily | — | — | — | — | –▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — | — | 6.10 W3XAL Boundbr'k, N.J. |
| 6.21 | TG2 | Guatemala City | ex.Su. | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — | 6.13 VE9HX Halifax, N. S. |
| 6.22 | YV1RG | Valera, Venez. | Daily | — | — | — | — | — | –▼ | ▼▼ | ▼▼ | ▼– | — | — | — | 6.13 COCD Havana, Cuba |
| 6.24 | HRD | LaCeiba, Honduras | ex Su. | — | — | — | — | — | — | — | –▼ | ▼▼ | ▼▼ | ▼– | — | 6.14 W8XK Pittsburgh |
| 6.24 | HIN | Trujillo, R.D. | ex.Su. | — | — | — | — | — | — | –▼ | ▼▼ | ▼▼ | ▼– | — | — | 6.15 CJRO Winnipeg,Man. |
| 6.25 | YV5RJ | Caracas, Ven. | ex.Su. | — | — | — | — | — | –▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼– | — | 6.17 XEXA Mexico City |
| 6.27 | YV5RP | Caracas,Ven. | ex.Su. | — | — | — | — | — | — | –▼ | ▼▼ | ▼▼ | ▼▼ | ▼– | — | 6.28 COHB Sancti-Spiritis,Cub |
| 6.29 | HIG | Trujillo City, R.D. | ex.Su. | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼– | — | |
| 6.30 | YV4RD | Maracay, Venez | ex.Su. | — | — | — | — | — | — | –▼ | ▼▼ | ▼▼ | ▼– | — | — | |
| 6.31 | HIZ | Trujillo, R.D. | ex.Su. | ▼▼ | ▼▼ | ▼▼ | — | — | — | — | — | — | — | — | –▲ | |
| 6.34 | HI1X | Trujillo, R.D. | Tu.&Fr. | — | — | — | — | — | — | — | — | ▼▼ | ▼▼ | — | — | 6.34 COCW Havana, Cuba |
| 6.36 | YV1RH | Maracaibo,Ven. | ex.Su. | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — | |
| 6.38 | YV5RF | Caracas, Ven. | ex.Su. | — | — | — | — | — | — | –▼ | ▼▼ | ▼▼ | ▼▼ | ▼– | — | |
| 6.40 | YV5RH | Caracas, Venez | ex.Su. | — | — | — | — | –▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼– | — | |
| 6.40 | TGQA | Quezaltenango,Guat. | ex.Su. | — | — | — | — | — | — | — | — | — | ▼▼ | ▼▼ | — | |
| 6.41 | TiPG | San Jose, C.R. | Daily | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼– | |
| 6.42 | YV6RC | Bolivar, Venez. | ex.Su. | — | — | — | — | — | –▼ | ▼▼ | ▼▼ | ▼▼ | ▼– | — | — | |
| 6.47 | YV3RD | Barquismento,Ven. | Daily | — | — | — | — | — | –▼ | ▼▼ | ▼▼ | ▼▼ | ▼– | — | — | |
| 6.50 | HIL | Trujillo City, R.D. | ex.Su. | — | — | — | — | — | –▼ | ▼▼ | ▼▼ | ▼– | — | — | — | |
| 6.52 | YV4RB | Valencia,Venez. | Daily | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼– | — | — | — | |
| 6.55 | YV6RB | Bolivar, Venez. | ex.Su. | — | — | — | — | — | –▼ | ▼▼ | ▼▼ | ▼▼ | ▼– | — | — | |
| 6.63 | HIT | Trujillo, R.D. | ex.Su. | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼– | — | — | — | |
| 6.63 | HC2RL | Guayaquil,Ec. | Su.&Tu. | — | — | — | — | — | –▼ | ▼▼ | ▼– | — | ▼▼ | ▼▼ | — | |
| 6.68 | TIEP | SanJose,C.R. | Daily | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼– | 7.38 XECR Mexico City |
| A | | | | | | | | | | | | | | | | |
| 7.80 | HBP | Geneva,Switz. | Mon. | — | — | — | — | — | — | –▼ | ▼▼ | — | — | — | — | |
| 7.89 | HC1RB | Quito, Ecuador | ex.Su. | — | — | — | — | — | — | — | — | — | ▼▼ | ▼▼ | — | 8.66 COJK Camaguey, Cuba |
| S | | | | | | | | | | | | | | | | |
| 9.12 | HAT-4 | Budapest,Hung. | Su&W. | — | — | — | — | — | — | — | ▼▼ | — | — | — | — | 8.96 COKG Santiago, Cuba , |
| 9.23 | HC2CW | Guayaquil,Ecu. | ex.Su. | — | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — | 9.00 COBZ Havana, Cuba. |
| 9 34 | OAX4J | Lima, Peru | Daily | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | |

Rule out FOUR rows of hour figures, leaving only those for YOUR Time Zone. Then, you'll know when to tune for desired stations. Conversely, by comparing your dial number with data herein, you can often identify those heard by chance. Megacycle numbers are purposely irregular in appearance, with three, two, one or no digits darker to denote the degree of signal strength experienced by the majority of listeners in America. "Local" Stations, which operate almost continuously are listed at the extreme right. "A", "S", and "C" at the left indicate spots used by Amateurs, Ships and AirCraft.

AM-▲ PM-▼ Both-→

| | | | | EDST | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Eastern (CD) | 12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| | | | | Central | 11 | 12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| | | | | Mountain | 10 | 11 | 12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| | | | | Pacific | 9 | 10 | 11 | 12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| | Meg. | Call | Place | | | | | | | | | | | | | | |
| | 4.11 | HCJB | Quito, Ecuador | ex.Mon. | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — | — | |
| | 4.76 | HJ2ABJ | Santa Marta, Col. | ex.Su. | — | — | — | — | — | -▼ | ▼▼ | ▼▼ | ▼▼ | ▼- | — | — | |
| | 4.78 | HJ1ABB | Barranquilla, Col. | ex.Su. | — | — | — | — | -▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — | |
| | 4.80 | HJ1ABE | Cartagena, Col. | Daily | — | — | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼- | — | |
| | 4.82 | HJ7ABB | Bucaramanga, Col. | ex.Su | — | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — | |
| | 4.84 | HJ3ABD | Bogota, Col. | Daily | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼- | |
| | 4.88 | HJ4ABP | Medellin. Col. | ex.Su. | — | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — | |
| C | 4.90 | HJ3ABH | Bogota, Col. | Daily | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — | |
| | 5.80 | YV5RC | Caracas, Venez. | Daily | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼- | — | |
| | 5.83 | TIGPH | SanJose, C.R. | ex.Su. | — | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — | |
| | 5.85 | YV1RB | Maracaibo, Ven. | ex.Su. | — | — | — | — | -▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼- | — | — | |
| | 5.85 | HI1J | San Pedro, D.R. | Daily | — | — | — | — | — | — | -▼ | ▼▼ | ▼▼ | — | — | — | |
| | 5.86 | YV 4RH | Valencia, Ven. | ex.Su. | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — | |
| | 5.87 | HRN | Tegucigalpa, Hon. | Daily | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼- | — | — | |
| | 5.88 | HI9B | Santiago, D.R. | ex.Su. | — | — | — | — | -▼ | ▼▼ | ▼▼ | ▼- | — | — | — | — | |
| | 5.90 | T1LS | San Jose, R.D. | ex.Su. | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — | |
| | 5.90 | YV3RA | Barquisimeto, Ven. | ex.Su. | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — | — | — | |
| | 5.93 | HH2S | Port-au-Pr., Haiti | ex.Su. | — | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | — | — | |
| | 5.93 | YV1RL | Maracaibo, Ven. | ex.Su. | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼- | — | — | |
| | 5.94 | TG2X | Guatemala City | MWSa | — | — | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | |
| | 6.00 | HP5K | Colon, Panama | Daily | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — | |
| | 6.01 | HJ3ABX | Bogota, Col. | Daily | — | — | — | — | — | -▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — | |
| | 6.02 | DJC | Berlin, Ger. | Daily | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼- | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | -▲ | |
| | 6.03 | HP5B | Panama City | Daily | — | — | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼- | — | |
| | 6.04 | HJ1ABG | Barranquilla, Col. | Daily | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▲▲ | |
| | 6.05 | HJ6ABA | Pereira, Col. | ex.Su. | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼- | — | |
| | 6.05 | GSA | London, Eng. | Daily | — | — | — | — | ▼▼ | ▼▼ | — | — | — | — | — | — | |
| | 6.07 | OAX4Z | Lima, Peru | ex.Su. | — | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼- | |
| | 6.11 | HJ6ABB | Manizales, Col. | ex.Su. | — | — | — | — | — | — | — | — | ▼▼ | ▼▼ | — | — | |
| | 6.11 | GSL | London, Eng. | Daily | — | — | — | — | — | — | -▼ | ▼▼ | ▼- | -▼ | ▼▼ | ▼- | |
| | 6.15 | HJ4ABE | Medellin, Col. | Daily | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼- | — | |
| | 6.15 | H15N | Moca City R.D. | ex.Su. | — | — | — | — | — | -▼ | ▼▼ | ▼- | — | — | — | — | |
| | 6.15 | YV5RD | Caracas, Ven. | Daily | — | — | — | — | -▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — | — | |
| | 6.21 | TG2 | Guatemala City | ex.Su. | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — | |
| | 6.22 | YV1RG | Valera, Venez. | Daily | — | — | — | — | — | -▼ | ▼▼ | ▼▼ | ▼- | — | — | — | |
| | 6.24 | HRD | LaCeiba, Honduras | ex Su. | — | — | — | — | — | — | — | -▼ | ▼▼ | ▼▼ | ▼- | — | |
| | 6.24 | HIN | Trujillo, R.D. | ex.Su. | — | — | — | — | — | — | -▼ | ▼▼ | ▼▼ | ▼- | — | — | |
| | 6.25 | YV5RJ | Caracas, Ven. | ex.Su. | — | — | — | — | — | -▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼- | — | |
| | 6.27 | YV5RP | Caracas, Ven. | ex.Su. | — | — | — | — | — | — | -▼ | ▼▼ | ▼▼ | ▼▼ | ▼- | — | |
| | 6.29 | HIG | Trujillo City, R.D. | ex.Su. | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼- | — | |
| | 6.30 | YV4RD | Maracay, Venez | ex.Su. | — | — | — | — | — | — | -▼ | ▼▼ | ▼▼ | ▼- | — | — | |
| | 6.31 | HIZ | Trujillo, R.D. | ex.Su. | ▼▼ | ▼▼ | ▼▼ | — | — | — | — | — | — | — | — | -▲ | |
| | 6.34 | HI1X | Trujillo, R.D. | Tu.&Fr. | — | — | — | — | — | — | — | — | ▼▼ | ▼▼ | — | — | |
| | 6.36 | YV1RH | Maracaibo, Ven. | ex.Su. | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — | |
| | 6.38 | YV5RF | Caracas, Ven. | ex.Su. | — | — | — | — | — | — | -▼ | ▼▼ | ▼▼ | ▼▼ | ▼- | — | |
| | 6.40 | YV5RH | Caracas, Venez | ex.Su. | — | — | — | — | -▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼- | — | |
| | 6.40 | TGQA | Quezaltenango, Guat. | ex.Su. | — | — | — | — | — | — | — | — | — | ▼▼ | ▼▼ | — | |
| | 6.41 | TiPG | San Jose, C.R. | Daily | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼- | |
| | 6.42 | YV6RC | Bolivar, Venez. | ex.Su. | — | — | — | — | — | -▼ | ▼▼ | ▼▼ | ▼▼ | ▼- | — | — | |
| | 6.47 | YV3RD | Barquismento, Ven. | Daily | — | — | — | — | — | -▼ | ▼▼ | ▼▼ | ▼▼ | ▼- | — | — | |
| | 6.50 | HIL | Trujillo City, R.D. | ex.Su. | — | — | — | — | — | -▼ | ▼▼ | ▼▼ | ▼- | — | — | — | |
| | 6.52 | YV4RB | Valencia, Venez. | Daily | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼- | — | — | — | |
| | 6.55 | YV6RB | Bolivar, Venez. | ex.Su. | — | — | — | — | — | -▼ | ▼▼ | ▼▼ | ▼▼ | ▼- | — | — | |
| | 6.63 | HIT | Trujillo, R.D. | ex.Su. | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼- | — | — | — | |
| | 6.63 | HC2RL | Guayaquil, Ec. | Su.&Tu. | — | — | — | — | — | -▼ | ▼▼ | ▼- | — | ▼▼ | ▼▼ | — | |
| A | 6.68 | TIEP | SanJose, C.R. | Daily | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼- | |
| | 7.80 | HBP | Geneva, Switz. | Mon. | — | — | — | — | — | — | -▼ | ▼▼ | — | — | — | — | |
| S | 7.89 | HC1RB | Quito, Ecuador | ex.Su. | — | — | — | — | — | — | — | — | — | ▼▼ | ▼▼ | — | |
| | 9.12 | HAT-4 | Budapest, Hung. | Su&W. | — | — | — | — | — | — | — | ▼▼ | — | — | — | — | |
| | 9.23 | HC2CW | Guayaquil, Ecu. | ex.Su. | — | — | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | — | |
| | 9 34 | OAX4J | Lima, Peru | Daily | — | — | — | — | — | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | ▼▼ | |

## NOTES

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| 6.00 | XEBT | Mexico City. |
| 6.00 | CFCX | Montreal, Que. |
| 6.01 | COCO | Havana, Cuba |
| 6.02 | XEUW | Vera Cruz, Mex. |
| 6.04 | W1XAL | Boston, Mass. |
| 6.06 | W8XAL | Cincinnati |
| 6.06 | W3XAU | Philadelphia |
| 6.07 | CFRX | Toronto, Ont. |
| 6.08 | W9XAA | Chicago |
| 6.09 | CRCX | Toronto, Ont. |
| 6.10 | W9XF | Chicago |
| 6.10 | W3XAL | Boundbr'k, N.J. |
| 6.13 | VE9HX | Halifax, N. S. |
| 6.13 | COCD | Havana, Cuba |
| 6.14 | W8XK | Pittsburgh |
| 6.15 | CJRO | Winnipeg, Man. |
| 6.17 | XEXA | Mexico City |
| 6.28 | COHB | Sancti-Spiritis, Cub |
| 6.34 | COCW | Havana, Cuba |
| 7.38 | XECR | Mexico City |
| 8.66 | COJK | Camaguey, Cuba |
| 8.96 | COKG | Santiago, Cuba |
| 9.00 | COBZ | Havana, Cuba. |

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AM-▲ PM-▾ Both-♦

|  | Meg. | Call | Place |  | EDST<br>Eastern(CD)<br>Central<br>Mountain<br>Pacific | 1<br>12<br>11<br>10<br>9 | 2<br>1<br>12<br>11<br>10 | 3<br>2<br>1<br>12<br>11 | 4<br>3<br>2<br>1<br>12 | 5<br>4<br>3<br>2<br>1 | 6<br>5<br>4<br>3<br>2 | 7<br>6<br>5<br>4<br>3 | 8<br>7<br>6<br>5<br>4 | 9<br>8<br>7<br>6<br>5 | 10<br>9<br>8<br>7<br>6 | 11<br>10<br>9<br>8<br>7 | 12<br>11<br>10<br>9<br>8 | 1<br>12<br>11<br>10<br>9 | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  | 4.11 | HCJB | Quito, Ecuador | ex.Mon. |  | — | — | — | — | — | ▾▾ | ▾▾ | ▾▾ | ▾▾ | ▾▾ | — | — |  |  |
|  | 4.76 | HJ2ABJ | Santa Marta, Col. | ex.Su. |  | — | — | — | — | — | —▾ | ▾▾ | ▾▾ | ▾▾ | ▾— | — | — |  |  |
|  | 4.78 | HJ1ABB | Barranquilla, Col. | ex.Su. |  | — | — | — | — | —▾ | ▾▾ | ▾▾ | ▾▾ | ▾▾ | ▾▾ | ▾▾ | — |  |  |
|  | 4.80 | HJ1ABE | Cartagena, Col. | Daily |  | — | — | — | — | — | — | — | — | ▾▾ | ▾▾ | ▾— | — |  |  |
|  | 4.82 | HJ7ABB | Bucaramanga, Col. | ex.Su |  | — | — | — | — | — | — | — | ▾▾ | ▾▾ | ▾▾ | ▾▾ | — |  |  |
|  | 4.84 | HJ3ABD | Bogota, Col. | Daily |  | — | — | — | — | — | — | ▾▾ | ▾▾ | ▾▾ | ▾▾ | ▾▾ | ▾— |  |  |
|  | 4.88 | HJ4ABP | Medellin. Col. | ex.Su. |  | — | — | — | — | — | — | — | ▾▾ | ▾▾ | ▾▾ | ▾▾ | — |  |  |
| C | 4.90 | HJ3ABH | Bogota, Col. | Daily |  | — | — | — | — | — | — | ▾▾ | ▾▾ | ▾▾ | ▾▾ | ▾▾ | — |  |  |
|  | 5.80 | YV5RC | Caracas, Venez. | Daily |  | — | — | — | — | ▾▾ | ▾▾ | ▾▾ | ▾▾ | ▾▾ | ▾▾ | ▾— | — |  |  |
|  | 5.83 | TIGPH | SanJose, C.R. | ex.Su. |  | — | — | — | — | — | — | — | ▾▾ | ▾▾ | ▾▾ | ▾▾ | — |  |  |
|  | 5.85 | YV1RB | Maracaibo, Ven. | ex.Su. |  | — | — | — | — | —▾ | ▾▾ | ▾▾ | ▾▾ | ▾▾ | ▾— | — | — |  |  |
|  | 5.85 | HI1J | San Pedro, D.R. | Daily |  | — | — | — | — | — | — | —▾ | ▾▾ | ▾▾ | — | — | — |  |  |
|  | 5.86 | YV 4RH | Valencia, Ven. | ex.Su. |  | — | — | — | — | — | ▾▾ | ▾▾ | ▾▾ | ▾▾ | ▾▾ | ▾▾ | — |  |  |
|  | 5.87 | HRN | Tegucigalpa, Hon. | Daily |  | — | — | — | — | — | — | ▾▾ | ▾▾ | ▾▾ | ▾— | — | — |  |  |
|  | 5.88 | HI9B | Santiago, D.R. | ex.Su. |  | — | — | — | — | —▾ | ▾▾ | ▾▾ | ▾— | — | — | — | — |  |  |
|  | 5.90 | T1LS | San Jose, R.D. | ex.Su. |  | — | — | — | — | — | — | ▾▾ | ▾▾ | ▾▾ | ▾▾ | ▾▾ | — |  |  |
|  | 5.90 | YV3RA | Barquisimeto, Ven. | ex.Su. |  | — | — | — | — | — | ▾▾ | ▾▾ | ▾▾ | ▾▾ | — | — | — |  |  |
|  | 5.93 | HH2S | Port-au-Pr., Haiti | ex.Su. |  | — | — | — | — | — | — | — | ▾▾ | ▾▾ | ▾▾ | — | — |  |  |
|  | 5.93 | YV1RL | Maracaibo, Ven. | ex.Su. |  | — | — | — | — | — | ▾▾ | ▾▾ | ▾▾ | ▾▾ | ▾— | — | — |  |  |
|  | 5.94 | TG2X | Guatemala City | MWSa |  | — | — | — | — | — | — | — | — | ▾▾ | ▾▾ | ▾▾ | ▾▾ |  |  |
|  | 6.00 | HP5K | Colon, Panama | Daily |  | — | — | — | — | — | — | ▾▾ | ▾▾ | ▾▾ | ▾▾ | ▾▾ | — |  | 6.00 XEBT Mexico City. |
|  | 6.01 | HJ3ABX | Bogota, Col. | Daily |  | — | — | — | — | — | —▾ | ▾▾ | ▾▾ | ▾▾ | ▾▾ | ▾▾ | — |  | 6.00 CFCX Montreal, Que. |
|  | 6.02 | DJC | Berlin, Ger. | Daily |  | ▾▾ | ▾▾ | ▾▾ | ▾▾ | ▾— | ▾▾ | ▾▾ | ▾▾ | ▾▾ | ▾▾ | ▾▾ | —▲ |  | 6.01 COCO Havana, Cuba |
|  | 6.03 | HP5B | Panama City | Daily |  | — | — | — | — | — | — | — | — | ▾▾ | ▾▾ | ▾— | — |  | 6.02 XEUW Vera Cruz, Mex. |
|  | 6.04 | HJ1ABG | Barranquilla, Col. | Daily |  | ▾▾ | ▾▾ | ▾▾ | ▾▾ | ▾▾ | ▾▾ | ▾▾ | ▾▾ | ▾▾ | ▾▾ | ▾▾ | ▲▲ |  | 6.04 W1XAL Boston, Mass. |
|  | 6.05 | HJ6ABA | Pereira, Col. | ex.Su. |  | — | — | — | — | — | — | ▾▾ | ▾▾ | ▾▾ | ▾▾ | ▾— | — |  |  |
|  | 6.05 | GSA | London, Eng. | Daily |  | — | — | — | — | ▾▾ | ▾▾ | — | — | — | — | — | — |  | 6.06 W8XAL Cincinnati |
|  | 6.07 | OAX4Z | Lima, Peru | ex.Su. |  | — | — | — | — | — | — | — | ▾▾ | ▾▾ | ▾▾ | ▾▾ | ▾— |  | 6.06 W3XAU Philadelphia |
|  | 6.11 | HJ6ABB | Manizales, Col. | ex.Su. |  | — | — | — | — | — | — | — | — | ▾▾ | ▾▾ | — | — |  | 6.07 CFRX Toronto, Ont. |
|  | 6.11 | GSL | London, Eng. | Daily |  | — | — | — | — | — | — | —▾ | ▾▾ | ▾— | —▾ | ▾▾ | ▾— |  | 6.08 W9XAA Chicago |
|  | 6.15 | HJ4ABE | Medellin, Col. | Daily |  | — | — | — | — | — | — | ▾▾ | ▾▾ | ▾▾ | ▾▾ | ▾— | — |  | 6.09 CRCX Toronto, Ont. |
|  | 6.15 | H15N | Moca City R.D. | ex.Su. |  | — | — | — | — | — | —▾ | ▾▾ | ▾— | — | — | — | — |  | 6.10 W9XF Chicago |
|  | 6.15 | YV5RD | Caracas, Ven. | Daily |  | — | — | — | — | —▾ | ▾▾ | ▾▾ | ▾▾ | ▾▾ | ▾▾ | — | — |  | 6.10 W3XAL Boundbr'k, N.J. |
|  | 6.21 | TG2 | Guatemala City | ex.Su. |  | — | — | — | — | — | — | ▾▾ | ▾▾ | ▾▾ | ▾▾ | ▾▾ | — |  | 6.13 VE9HX Halifax, N. S. |
|  | 6.22 | YV1RG | Valera, Venez. | Daily |  | — | — | — | — | — | —▾ | ▾▾ | ▾▾ | ▾— | — | — | — |  | 6.13 COCD Havana, Cuba |
|  | 6.24 | HRD | LaCeiba, Honduras | ex Su. |  | — | — | — | — | — | — | — | —▾ | ▾▾ | ▾▾ | ▾— | — |  | 6.14 W8XK Pittsburgh |
|  | 6.24 | HIN | Trujillo, R.D. | ex.Su. |  | — | — | — | — | — | — | —▾ | ▾▾ | ▾▾ | ▾— | — | — |  | 6.15 CJRO Winnipeg, Man. |
|  | 6.25 | YV5RJ | Caracas, Ven. | ex.Su. |  | — | — | — | — | — | —▾ | ▾▾ | ▾▾ | ▾▾ | ▾▾ | ▾— | — |  | 6.17 XEXA Mexico City |
|  | 6.27 | YV5RP | Caracas, Ven. | ex.Su. |  | — | — | — | — | — | — | —▾ | ▾▾ | ▾▾ | ▾▾ | ▾— | — |  | 6.28 COHB Sancti-Spiritis, Cub |
|  | 6.29 | HIG | Trujillo City, R.D. | ex.Su. |  | — | — | — | — | ▾▾ | ▾▾ | ▾▾ | ▾▾ | ▾▾ | ▾▾ | ▾— | — |  |  |
|  | 6.30 | YV4RD | Maracay, Venez | ex.Su. |  | — | — | — | — | — | — | —▾ | ▾▾ | ▾▾ | ▾— | — | — |  |  |
|  | 6.31 | HIZ | Trujillo, R.D. | ex.Su. |  | ▾▾ | ▾▾ | ▾▾ | — | — | — | — | — | — | — | — | —▲ |  |  |
|  | 6.34 | HI1X | Trujillo, R.D. | Tu.&Fr. |  | — | — | — | — | — | — | — | — | ▾▾ | ▾▾ | — | — |  | 6.34 COCW Havana, Cuba |
|  | 6.36 | YV1RH | Maracaibo, Ven. | ex.Su. |  | — | — | — | — | ▾▾ | ▾▾ | ▾▾ | ▾▾ | ▾▾ | ▾▾ | ▾▾ | — |  |  |
|  | 6.38 | YV5RF | Caracas, Ven. | ex.Su. |  | — | — | — | — | — | — | —▾ | ▾▾ | ▾▾ | ▾▾ | ▾— | — |  |  |
|  | 6.40 | YV5RH | Caracas, Venez | ex.Su. |  | — | — | — | — | —▾ | ▾▾ | ▾▾ | ▾▾ | ▾▾ | ▾▾ | ▾— | — |  |  |
|  | 6.40 | TGQA | Quezaltenango, Guat. | ex.Su. |  | — | — | — | — | — | — | — | — | — | ▾▾ | ▾▾ | — |  |  |
|  | 6.41 | TiPG | San Jose, C.R. | Daily |  | — | — | — | — | — | — | ▾▾ | ▾▾ | ▾▾ | ▾▾ | ▾▾ | ▾— |  |  |
|  | 6.42 | YV6RC | Bolivar, Venez. | ex.Su. |  | — | — | — | — | — | —▾ | ▾▾ | ▾▾ | ▾▾ | ▾— | — | — |  |  |
|  | 6.47 | YV3RD | Barquismento, Ven. | Daily |  | — | — | — | — | — | —▾ | ▾▾ | ▾▾ | ▾▾ | ▾— | — | — |  |  |
|  | 6.50 | HIL | Trujillo City, R.D. | ex.Su. |  | — | — | — | — | — | —▾ | ▾▾ | ▾▾ | ▾— | — | — | — |  |  |
|  | 6.52 | YV4RB | Valencia, Venez. | Daily |  | — | — | — | — | — | ▾▾ | ▾▾ | ▾▾ | ▾— | — | — | — |  |  |
|  | 6.55 | YV6RB | Bolivar, Venez. | ex.Su. |  | — | — | — | — | — | —▾ | ▾▾ | ▾▾ | ▾▾ | ▾— | — | — |  |  |
|  | 6.63 | HIT | Trujillo, R.D. | ex.Su. |  | — | — | — | — | — | — | ▾▾ | ▾▾ | ▾— | — | — | — |  |  |
|  | 6.63 | HC2RL | Guayaquil, Ec. | Su.&Tu. |  | — | — | — | — | — | —▾ | ▾▾ | ▾— | — | ▾▾ | ▾▾ | — |  |  |
| A | 6.68 | TIEP | SanJose, C.R. | Daily |  | — | — | — | — | — | — | ▾▾ | ▾▾ | ▾▾ | ▾▾ | ▾▾ | ▾— |  | 7.38 XECR Mexico City |
|  | 7.80 | HBP | Geneva, Switz. | Mon. |  | — | — | — | — | — | — | —▾ | ▾▾ | — | — | — | — |  |  |
| S | 7.89 | HC1RB | Quito, Ecuador | ex.Su. |  | — | — | — | — | — | — | — | — | — | ▾▾ | ▾▾ | — |  | 8.66 COJK Camaguey, Cuba |
|  | 9.12 | HAT-4 | Budapest, Hung. | Su&W. |  | — | — | — | — | — | — | — | ▾▾ | — | — | — | — |  | 8.96 COKG Santiago, Cuba |
|  | 9.23 | HC2CW | Guayaquil, Ecu. | ex.Su. |  | — | — | — | — | — | — | — | ▾▾ | ▾▾ | ▾▾ | ▾▾ | — |  | 9.00 COBZ Havana, Cuba. |
|  | 9 34 | OAX4J | Lima, Peru | Daily |  | — | — | — | — | — | ▾▾ | ▾▾ | ▾▾ | ▾▾ | ▾▾ | ▾▾ | ▾▾ |  |  |